AIR POLLUTION CONTROL PROGRESS

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE HOUSE OF REPRESENTATIVES

EIGHTY-SIXTH CONGRESS

SECOND SESSION

ON

PROGRESS BEING MADE IN AIR POLLUTION CONTROL

FEBRUARY 23 AND 24, 1960

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AIR POLLUTION CONTROL PROGRESS

TUESDAY, FEBRUARY 23, 1960

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON HEALTH AND SAFETY,
OF THE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m., in room 1334, New House Office Building, Hon. Kenneth A. Roberts (chairman of the subcommittee) presiding.

Mr. ROBERTS. The committee will be in order.

I am advised that other members of the subcommittee are on the way, and as I have a rather long statement and a good bit of territory to cover, and witnesses to hear from today, I think it would be well to get started.

The Subcommittee on Health and Safety is meeting today to study progress being made in air pollution control.

The principal purpose of the hearing is to review progress being made in eliminating noxious unburned hydrocarbons from motor vehicle exhausts. We understand that recently the industry has found that a great deal of smog-producing pollutants come from the crankcase vents of automobile engines. What is especially encouraging is that the industry has a very cheap method of control for these fumes.

We understand that the automobile manufacturers propose to equip automobiles to be sold in the State of California with an arrangement to pump these crankcase fumes back into the engines to be burned.

We want to know why, if the arrangement is as effective and as cheap as reported, it cannot be made standard equipment on all motor vehicles. Air pollution does not stop at State boundaries.

On the basis of accepted scientific studies, it is generally agreed that this smog is a serious health menace, as well as a disrupter of transportation, and the cause of agricultural damages running into the millions each year.

That air pollution is a national problem and a menace to health is generally accepted. We need only to cite the 1948 incident in Donora, Pa., where 20 people died and half the population suffered nonfatal illness. In London, during a siege of smog in 1952, between 4,000 and 5,000 more people died in 1 week than could be expected under normal conditions.

This committee has given serious study to this problem in recent years. In 1956 the Subcommittee on Traffic Safety made a study of noxious, toxic, and harmful motor vehicle exhaust fumes. As a result of that study, our colleague, the Honorable Paul Schenck, a member of the subcommittee, introduced legislation to prohibit the use in commerce of motor vehicles which discharge unburned hydrocarbons

in excess of an amount found by the Surgeon General to be dangerous to human health. Hearings were held on this legislation in March 1958 and again in July last year. The Subcommittee on Health and Safety last year also held hearings on air pollution in connection with legislation to extend the Federal-aid program.

In November 1958, the Department of Health, Education, and Welfare held a National Conference on Air Pollution here in Washington, which brought together nationally known leaders to discuss this problem. Proceedings of this conference were published by the Department and are an important source of information on this problem.

Dr. Leslie A. Chambers, director of research, Los Angeles County Air Pollution Control District, told the conference in 1958 that—

> automobile exhausts are the source of most of the objectionable qualities of air pollution in Los Angeles.

A witness in our 1958 hearings was Dr. C. A. Mills, professor of experimental medicine, University of Cincinnati, a leading authority on health hazards resulting from air pollution. He told the subcommittee that the hazard of developing lung cancer is increased two or three times for a smoker who drives 12,000 miles or more in heavy city traffic where he is exposed to automobile exhaust fumes.

Dr. Mills told the committee that mass deaths from air pollution, such as in the Donora disaster in 1948—

> are more dramatic but also perhaps of less overall importance than the slower damage to the air passages and lungs.

He said a study shows that respiratory and cardiac deaths are higher in Los Angeles on smoggy days, suggesting that—

> still more importance is perhaps to be attached even there to the more chronic types of pollution damage slowly leading to the initiation of cancer and perhaps emphysema.

In our 1959 hearings statistics were cited showing that lung cancer deaths are twice as high in the larger cities than in rural areas.

In those hearings, Dr. Theodore Bauer, Deputy Chief, Bureau of State Services, Public Health Service, speaking of Public Health research activities, told the subcommittee:

> Data has been developed about many ways in which air pollution subtly affects human health, including specific knowledge about the effects of agents such as ozone and sulfur dioxide, which are directly toxic and physiologically damaging, and certain olefin compounds which can cause eye irritations in humans and serious toxic effects in experimental animals.

So, I am sure no one who knows anything about the subject seriously doubts that air pollution is a serious public health problem.

In our 1958 hearings, we were told that up to that time more than $73 million has been spent on air pollution control in Los Angeles County alone.

Mr. Smith Griswold, air pollution control officer of Los Angeles County, told the subcommittee:

> There remains one source air pollution beyond our power to control. Every day in Los Angeles County nearly 3 million automobiles are burning 5½ million gallons of gasoline, and fouling our air with 8,000 tons of contaminants. These emissions include 6,400 tons of carbon monoxide, 300 tons of oxides or nitrogen, and 1,050 tons of hydrocarbons.

Our scientific consultants term these substances "toxic air contaminants." They are poisons.

Mr. William G. Christy, New York consulting engineer, was quoted as saying that in many communities having air pollution problems, the damage to residents amounts to $30 or $40 per capita. He estimated the damage in New York City at more than $225 million a year, and the total cost to the entire country to as much as $5 billion a year.

Dr. James P. Dixon, commissioner of health for Philadelphia, told the 1958 conference—

it is clear that, under some circumstances, acute air pollution can cause death among older persons and can cause serious illness to others.

Then he added:

The available data demand two courses of action. First, every reasonable effort should be made to reduce the quality of pollution discharged into our atmosphere. Second, research into the specific health effects of air pollution should be vigorously encouraged so that adequate knowledge around which we can construct specific control measures may become available as soon as possible.

The question is now that we have identified automobile exhaust gases as one of the chief culprits, what are we going to do about it?

I am delighted that the Automobile Manufacturers Association has sent two able representatives to discuss this problem.

That concludes the statement of the Chair.

At this time, without objection, I would like to place into the record a letter and report from Mr. Warren M. Dorn, supervisor, fifth district, Los Angeles County, chairman, air pollution committee.

I would like to pass it around for inspection of the members before I ask to include it in the record.

(The matter referred to follows:)

THE COUNTY OF LOS ANGELES, BOARD OF SUPERVISORS,
Los Angeles, Calif., February 19, 1960.

Hon. KENNETH A. ROBERTS,
Chairman, Subcommittee on Health and Safety, Committee on Interstate and Foreign Commerce, House Office Building, Washington, D.C.

DEAR MR. CHAIRMAN: Thank you for your letter of February 12 concerning the hearings which you have set for February 23 and 24 to review progress made in controlling motor vehicle exhausts.

I regret that the press of other business will make it impossible for me or a representative of Los Angeles County to testify in person at the hearings. However, I appreciate the fact that you plan to make my letter of February 1 and its enclosure a part of the record.

Inasmuch as Los Angeles County will not be represented officially at the hearings, I am enclosing additional information which may prove helpful to the subcommittee in its deliberations.

This information includes the position of the Los Angeles County Board of Supervisors with respect to the installation of "blowby" control devices on county-owned cars and other vehicles in the county; the draft of a report by the county air pollution control district on recent engineering and legislative developments in exhaust control; bills introduced in the 1959 California Legislature; and testimony of Air Pollution Officer S. Smith Griswold and State Senator Richard Richards at a recent Senate committee hearing in Los Angeles.

If you feel that any of this information is pertinent to the subject of the February 23 and 24 hearings, I would be most happy to have you include it as part of the record.

Meanwhile, should you or members of your subcommittee see fit to explore the subject of air pollution control devices on any future occasion in the Los Angeles area, I would be happy to meet with you or to arrange for you to visit the facilities of the air pollution control district.

Again, thank you for the invitation to appear before the subcommittee. I regret that we cannot be represented, but desire to cooperate in every way with you on this important matter.

Sincerely yours,

WARREN M. DORN,
Supervisor, Fifth District, Los Angeles County; Chairman, Air Pollution Committee.

THE COUNTY OF LOS ANGELES BOARD OF SUPERVISORS,
Los Angeles, Calif., January 12, 1960.

The Board of Supervisors of the County of Los Angeles and ex officio the Air Pollution Control Board of the Air Pollution Control District of the County of Los Angeles, State of California, met in regular session. Present: Supervisors Frank G. Bonelli (chairman) presiding, Kenneth Hahn, Ernest E. Debs, Burton W. Chace, and Warren M. Dorn; and Gordon T. Nesvig, clerk.

38. IN RE AIR POLLUTION CONTROL: ORDER INSTRUCTING CHIEF ADMINISTRATIVE OFFICER AND AFFECTED COUNTY DEPARTMENTS TO IMMEDIATELY UNDERTAKE INSTALLATION OF "BLOWBY" CONTROL DEVICES ON COUNTY-OWNED CARS, AND RELATED ORDERS

Supervisor Dorn presents the following statement:

"The Los Angeles County Board of Supervisors, acting as the Air Pollution Control Board, has adopted a policy of controlling all known sources of air pollution as soon as reasonable means are available to do so.

"In line with this policy, the board instructed the air pollution control district to investigate statements made on November 30, 1959, by the Automobile Manufacturers Association indicating that crankcase 'blowby' losses were responsible for about one-third of thetotal automobile hydrocarbon emissions, and that a simple, inexpensive device, already on the market, could be installed readily to control them.

"This board will recall that the Automobile Manufacturers Association announced its plans to install such devices on all 1961 models to be sold in California.

"The air pollution control district has completed its investigation of the statements and has performed research in its laboratories using three types of 'blowby' control devices on various makes of automobiles. The air pollution control district's results are generally in accord with those reported by the automobile industry.

"It must be emphasized that the recognition of this 'blowby' loss raises the estimated total emission of hydrocarbons from automobiles to 1,500 tons per day from the previous estimate of 1,000 tons. While the control of these 'blowby' losses alone will not eliminate smog, nor will they in any way control the emissions of carbon monoxide, nevertheless they are of sufficient magnitude to require control if a complete elimination is to be made of the smog forming contribution of the automobile.

"It will still be necessary to use exhaust control devices to reduce motor vehicle emissions of both hydrocarbons and carbon monoxide to meet the standards that have been established by the State. However, research indicates that the installation of these inexpensive 'blowby' control devices on all cars would lessen the severity of smog episodes, and may offset the cost by slightly improving gasoline mileage.

"I have before me two devices which were purchased off the shelf of standard retail outlets in Los Angeles County. One of these was bought for 99 cents. The cost of others on the market ranges from that price up to $15 or $20. I have been advised by the technical staff of the air pollution control district that all of these devices can dispose of 'blowby' losses effectively, although some will not foul the carburetor as much as others.

"In view of the results of this research and in line with the policy of this board, I therefore recommend—

"(1) That the chief administrative officer and affected county departments immediately undertake the installation of 'blowby' control devices on the 3,530 gasoline-fueled vehicles owned and operated by the county of Los Angeles;

"(2) That the clerk of this board communicate with other public and major private fleet operators in Los Angeles County urging them to follow the leadership of this board in undertaking the immediate installation of such devices;

"(3) That this board urge the legislature to act favorably at the special session in March on a measure requiring the installation of 'blowby' control devices as soon as feasible in all areas subject to such control legislation; and that the air pollution control district, when presenting the county's nine-point program to the Governor's committee next week, include as part of the county program this additional information."

And on motion of Supervisor Dorn, unanimously carried, this board hereby approves the recommendations (1) through (3) in the above-quoted statement.

I, Gordon T. Nesvig, clerk of the Board of Supervisors of the County of Los Angeles and ex officio clerk of the Air Pollution Control Board of the Air Pollution Control District of the County of Los Angeles, State of California, do hereby certify that the foregoing is a full, true, and correct copy of an order which was adopted by the air pollution control board of the air pollution control district of said county on January 12, 1960, and entered in the minutes of said board.

In witness whereof, I have hereunto set my hand and affixed the seal of the board of supervisors this 19th day of February 1960.

GORDON T. NESVIG,
Clerk of the Board of Supervisors of the County of Los Angeles and Ex Officio Clerk of the Air Pollution Control Board of the Air Pollution Control District of the County of Los Angeles, State of California.

Mr. ROBERTS. Mr. Richards, who is manager of the field service department of the Automobile Manufacturers Association from Detroit, is accompanied by George M. Delaney, technical engineering representative of the Automobile Manufacturers Association, also of Detroit. He will now present his testimony to the committee.

STATEMENT OF KARL M. RICHARDS, MANAGER, FIELD SERVICE DEPARTMENT, AUTOMOBILE MANUFACTURERS ASSOCIATION, DETROIT, MICH.

Mr. RICHARDS. Mr. Chairman and members of the committee, my name is Karl M. Richards. I represent the Automobile Manufacturers Association, with offices in the New Center Building, Detroit, Mich.

The AMA welcomes this opportunity to discuss air pollution problems with your committee and to report developments with respect to devices for motor vehicles.

As this committee knows from previous reports, the motor vehicle manufacturers have been seriously concerned with this problem for some time.

For the past 6 years, the AMA has worked closely with Los Angeles and California State authorities, and has cooperated with the U.S. Department of Health, Education, and Welfare, as well as with the members of this body. From the beginning, the motor vehicle manufacturers have accepted the thesis that motor vehicle emissions, along with many other sources, contribute to the air pollution problems of certain California areas and, working as a team, the manufacturers have made a major effort to develop control measures.

We understand that today you are particularly interested in hearing about the latest development of a system to recirculate and burn crankcase blowby gases and thus eliminate a substantial part of unburned hydrocarbon emissions from the motor vehicle.

With your permission, I should first like to tell you about this system and then round out the picture by bringing you up to date on the general progress since our previous appearance.

The motor vehicle manufacturers have recently developed improved measuring instruments and techniques. These have led to the finding that crankcase blowby is a major source of the unburned hydrocarbons now emitted by motor vehicles.

The attached paper presented at the annual meeting of the Society of Automotive Engineers in Detroit on January 14, 1960, indicates that, in individual vehicles, from 20 to 70 percent of the total unburned hydrocarbon emissions, including both exhaust and crankcase, can be halted by application of internal venting, routing blowby gases back into the cylinders where they are burned in the engine. This operation does not increase the amount of unburned hydrocarbons coming out of the tailpipe.

Because of the urgency of the problem in some areas in California, the AMA announced on November 30, 1959, that the system would be offered on new vehicles produced in the United States for sale in that State not later than the introduction of 1961 models this fall.

The device has many virtues, among them simplicity, low first cost, long service life, and ease of inspection to determine whether or not it is operating properly. This device is not, however, simple in the sense that little or no engineering is required for its development and adaptation.

Two basic types of devices have been used commercially to provide positive crankcase ventilation for special operating conditions, including military vehicles which ford streams. These are:

(1) Breathing above the carburetor where the air cleaner vacuum is used to draw the gases out of the crankcase; and

(2) Breathing below the carburetor where intake manifold vacuum is used as a flow-inducing means.

These systems have both been used since before World War II, but field experience shows that the first method, the above carburetor system, occasionally permits heavy varnish deposits to build up on carburetor parts. This system is still used on some marine engines and a few foreign-built cars. However, it is not considered satisfactory because of inadequate control of hydrocarbon emissions.

Some misunderstanding has grown out of recent publicity about a device which uses only a simple piece of tubing attached to the draft tube from the crankcase and inserted into the air cleaner above the carburetor. This type of device is not the one selected by the motor vehicle manufacturers for the reasons given.

The second method, the below carburetor method, is more successful. It has been and is still being used on large numbers of military engines and larger trucks as a means of keeping dirt and water out of crankcases. It is also used in limited numbers on taxicabs for improving crankcase ventilation. This is the system chosen for development by the motor vehicle manufacturers, because it provides 100-percent control of crankcase emissions.

The conclusion of the company engineers with respect to the application of these devices is that the below-carburetor method can be used successfully and satisfactorily.

As previously stated, the voluntary undertaking of the motor vehicle manufacturers to offer the device on new vehicles produced in

the United States for sale in California not later than the introduction of 1961 models was based on the urgency of the smog problem in Los Angeles. Nevertheless, after the motor vehicle manufacturers meet this California obligation, the devices can be made available for any other area where it might be determined that they are needed or wanted.

Since our last appearance before you, we have also made encouraging progress in the control of exhaust emissions.

Prototypes of the low-temperature converter had already been sent to California for widespread testing when we reported to your committee previously. Since that time, they have proved themselves capable of eliminating more than 50 percent of total unburned exhaust hydrocarbons, and more than 70 percent of the troublesome olefins.

Additional progress has been made in the development of the high-temperature catalytic converter. Prototypes for testing should be available in California in the near future.

Notable advances have been made in the refinement of the so-called straight afterburners. When we last reported to you, these devices were still so complex that engineers despaired of bringing production costs down close to reason. Now major attention is being devoted to a manifold type of unit which holds much promise. It requires one or two operating controls instead of eight. Burning would take place in the exhaust manifold where heat problems are at a minimum. It is expected that prototype models of this unit can also be available for testing some time in 1960.

The deceleration devices supplied to California authorities in 1957 are capable of reducing exhaust emissions of unburned hydrocarbons by 15 to 20 percent. These devices are relatively inexpensive and, in combination with other low-cost approaches to the problem, might be more than enough to satisfy the requirements of areas where automotive contributions to air pollution constitute a marginal problem.

In addition, broad research in fuels, combustion, and engines is going forward intensively. Further improvements in motor vehicle efficiency may be expected. In time, these may permit operation of vehicles everywhere without the addition of expensive special devices to meet local air pollution problems.

On the question of nationwide need for emission control devices, we believe it proper to point out that there are many kinds and many degrees of air pollution and that much remains to be learned about the causes and effects of each.

As you know, scientists and engineers explain that the California problem results from an unusual combination of a persistent blanket temperature inversion, encircling mountains, very light wind movements, and intensive sunlight. All or most of these conditions must be present in combination with a sufficient concentration of hydrocarbons and oxides of nitrogen to produce the type of reaction known as photochemical smog.

The popular term "Los Angeles smog" thus has a sound origin, because photochemical smog is a form of air pollution not likely to occur anywhere else on earth with the frequency and intensity found in this area.

Unburned hydrocarbons play no substantial part in the formation of the classic London smog, which has affected many of our northern

industrial cities from time to time. This type is characteristically composed of large quantities of coal smoke, sulfur dioxide, and fog, and effective remedies have been applied in such widely known instances as those of St. Louis and Pittsburgh.

The St. Louis and Pittsburgh remedies were tried in Los Angeles without notable success. Attempts to apply sweeping remedies across the Nation would be unfair to the public.

SUMMARY

(1) The motor vehicle manufacturers will make any proven air pollution control device available to any area that needs or wants it.

(2) The motor vehicle manufacturers, knowing that air pollution problems differ widely, believe that each community should be studied carefully in order to establish its specific requirements. Attempts at broad and sweeping solutions would only invite failure and would be unfair to the public.

(3) Because of their serious concern with air pollution, the motor vehicle manufacturers will continue their major effort to arrive at practical, economic means of reducing any objectionable motor vehicle emissions.

(4) The motor vehicle manufacturers will continue to cooperate with officials at all levels of government to improve technical bases for defining the problem, evaluating control measures, and reducing the burden and inconvenience of inspection programs on both motorists and their governments.

If the committee has any questions not covered by this statement, we will be pleased to supplement it with the best information at our command.

Mr. ROBERTS. Thank you, Mr. Richards. I am sure there will be some questions.

First of all, in the first paragraph of your statement at page 4, you speak of the selection of below-carburetor method as being more successful and this is the one that the industry has selected, because you say it provides 100-percent control of these crankcase emissions.

Would you give us an estimate of the cost of that per vehicle?

Mr. RICHARDS. We in the association have no information on the cost, and I doubt very much that at this point any of the factories have accurate, detailed information. But we discussed that problem, and based on this past experience that is referred to it in my statement, I think we can give you some indication, since such devices have been used.

If they are included as factory optional equipment installations, they probably will be under $10. This varies. The system in its adaption to different engines will not be the same probably for any two engines. There will be variations, and so there will be in the cost.

For kits available for purchase and installation on different models of older vehicles, that can vary between vehicles from somewhere in the neighborhood of $15 to $30.

I have set out here on the table, Mr. Chairman, an indication of the distinction between the simple above-carburetor device that is available—you can pick it up at any of the stores that supply automotive equipment—and here is an illustration of one, which simply

connects with the outlet and goes into the breather at the top. It is just a simple connection. This particular one was picked up and the box indicates 79 cents. That is the device without installation.

Mr. ROBERTS. Is that the device that Supervisor Dorn has in mind that is being used in California?

Mr. RICHARDS. It is one similar to that.

I think his letter made clear, and this was partly on our suggestion, when he asked that the county vehicles be equipped with these devices, it was called to his attention that this above-carburetor device was not recommended by the industry. We had experience with it.

In the first place, the main reason for discarding it is that it does not give 100-percent control of the hydrocarbon emissions from the crankcase.

Secondly, it introduces a lot of troubles, and can, without proper installation, introduce very serious mechanical problems.

So we suggested that they might test this on a limited number. I believe his letter indicated that they were installing devices on some 100 motor vehicles. How complete their test has been, we don't know. But this is not the one selected by the industry.

I have here one of the devices that gives you an indication of what is involved. They are not inexpensive in the same term as the first one I illustrated. This goes under the carburetor and there is a valve involved here that controls the flow into the intake manifold, and your connection here with the blowby exhaust, and the tube that ties up the two.

This is the device that I mentioned would cost from $15 to $30 installed on the market. It is the more effective, the one that we have had the best experience, and is the one that was selected by the industry for fulfilling its commitment to California.

Mr. ROBERTS. Could this type of device or the device that the industry is planning to install on the California 1961 models be successfully adapted to trucks and buses as well as passenger vehicles?

Mr. RICHARDS. As a matter of fact, there has been more used on trucks in the past. There has been more experience on heavy trucks than on any other vehicle.

The commitment was to furnish all of the vehicles produced in the United States at that time, which would include automobiles, trucks, and buses, with this device.

Mr. ROBERTS. I was interested on page 6 of your statement when you singled out the Los Angeles smog as being a type of photochemical smog. You say it is not likely to occur anywhere else on earth with the frequency and intensity found in this area.

We have listened to a great many statements here in the subcommittee on the subject of air pollution, but that is the first time that I have seen that particular statement. I would just like to know your authority for that statement.

Mr. RICHARDS. I think it is quite evident by the conditions that exist in Los Angeles and the amount of study that has been given to that problem.

Los Angeles, as you probably know, was known as the valley of smog before white men came in there. The inversion layer held the smogs of the Indian campfires over the valley and that condition is

more intense in Los Angeles than any other section because of the topography of the country. Then when you add to that the millions of people and the industry and the motor vehicles, you have a condition that probably could not be duplicated anywhere else in the world unless you were able to duplicate population, industry, and automobiles.

Mr. ROBERTS. I agree. That might be my own opinion, too.

What I am talking about is, can you give an authority for the pinpointing of that particular type of smog?

Do you have any of the people in the air pollution field or the medical test of scientific expert opinion, or is that your own opinion?

Mr. RICHARDS. It is the opinion of the industry.

I think if you are interested, we might try to assemble some statements that would indicate this to be true.

Mr. ROBERTS. If it is possible for you to do it, Mr. Richards, I would like to receive that.

Mr. RICHARDS. This is not the area of our competence, as you recognize. We cooperate with those who are in the field. I think it is pretty clearly established, for example, that no other area has indicated that unburned hydrocarbons are an important part of their air pollution.

Mr. ROBERTS I would like to recall this to your mind. I remember that last fall when I visited this particular area that Sacramento was having at that time a very dangerous smog situation. It was so bad, as a matter of fact, that at their State meeting of the board of supervisors from all over the State they adopt a resolution to ask the Congress of the United States to look into this problem because it was also a problem in Sacramento. It had reached a concentration of oxidants that were irritating and very dangerous to the population.

It is my thinking that these same conditions can obtain in any large metropolitan area where you have a heavy concentration of automotive and truck traffic.

I think that undoubtedly we will see in the findings of the national conference held here there was considerable opinion to the effect that these conditions could occur in any of our big metropolitan areas. I recognize there is an unusual geographical situation in Los Angeles.

Mr. RICHARDS. Mr. Roberts, as you know, they are holding a special session of the California Legislature, and now that they are reaching the point of legislating in California, I find considerable question in the minds of people outside of the Los Angeles area as to whether or not their air pollution problem is directly related to the Los Angeles one. It certainly is not in intensity. Whether it has that possibility I think there is a grave question.

Some people have intimated that if the bay area, for example, increases in population and motor vehicle population that they will have the same condition as Los Angeles. But some have pointed out that they have a wind condition that clears the atmosphere so that they feel that under no circumstances could they ever suffer to the degree of Los Angeles.

Mr. ROBERTS. I am sure you know there is a great deal of expert opinion to the effect that we know very little about how much of this

material it takes to set cancer in motion. That is one of the reasons we have had Dr. Flemming here before our full committee on a bill we are considering now.

I think it is rather hard to say that these conditions might not very well obtain in some other areas of the country.

Mr. ROGERS of Florida. Mr. Chairman, I might point out for refreshing the memory of the subcommittee, right here in Washington we had this condition prevail for about 3 days, mainly in the area on the parkway at 14th Street. It was written up in the papers. The Public Health Service went in and tested and felt that it was smog that was caused mainly by automobile exhaust.

I experienced myself smarting of the eyes, which I understand is a condition somewhat similar to that of Los Angeles, although I realize we do not have the same intensity. I think it is a problem that will continue to grow and spread as we increase the use of automobiles and concentrate them in these areas.

Mr. RICHARDS. I think the statement as we have made it here, that these conditions have to be in combination in order to create photochemical smog—and I don't say you don't get it—it is so rare in other areas that it does get into the newspaper.

Mr. ROBERTS. At the bottom of page 6 you stated that unburned hydrocarbons play no substantial part in the formation of the classic London smog which has affected many of our northern industrial cities from time to time. How do you know that is true?

Mr. RICHARDS. The air pollution people in their analysis of this problem have come up with the basic data that we have given here, that it is a combination of coal smoke and sulfur dioxide with fog that holds it into suspension. Apparently the hydrocarbons do not cause irritation. We don't know the health effects of that. That was one of the reasons for suggesting to this committee last year that here is an area that needs additional study.

Mr. ROBERTS. That being true, why was it that the industry vigorously opposed even the moderate attempt that this subcommittee made and that the House of Representatives made in passing the Schenck bill which provided that the Public Health Service do research in this field.

Mr. RICHARDS. I don't believe the industry has been opposed to research.

Mr. ROBERTS. They have been opposed to the bill. I can testify to that.

Mr. RICHARDS. I think it is based on other considerations rather than the question of research.

As a matter of fact, one of our member companies is making a very substantial contribution to research in the area of cancer causation. We are very vitally interested in getting more facts and more information on the subject because only with those facts can we make our major contribution in controlling what is objectionable.

Mr. SCHENCK. Mr. Chairman, may I suggest that this contribution to which Mr. Richards refers was made either very closely before or immediately after the Congress considered my bill. That is a statement for the record.

Mr. RICHARDS. Yes.

Mr. ROBERTS. In the summary on page 7, you say that the motor vehicle manufacturers will make any proven air pollution control device available to any area that needs it or wants it.

What I would like to know is, Is it going to be necessary for all these various areas to either pass a law, or threaten to pass one, before the manufacturers will be willing to put these devices on cars?

Mr. RICHARDS. I think the concern with the manufacturers and their concern with their customer, the motorist, is that we don't want to put devices on the vehicle that are not serving a purpose for him. We have no information that indicates that this unburned hydrocarbon problem that we are working on for California is a substantial or important part of the air-pollution problem of other areas of the United States.

While it is a small amount that you speak of here, when you multiply that by 7 million vehicles, $10 becomes $70 million that we are asking the motoring public to pay, when we have not established the need.

In California they have done more research. As I pointed out, Los Angeles applied the St. Louis and the Pittsburgh approach. They have worked on each one of the probable contributors and they have come down now to the motor vehicle which they say is the main contributor at this point in their control.

What we are doing there is this: We do not assume responsibility that when these controls are put on motor vehicles that Los Angeles smog will cease and people stop crying in that area. We do not know. That worries us a great deal when they contemplate important expenditures on the part of the 3 million car owners in that area. We are quite concerned.

What are they going to get for their money?

Will it solve their problem?

Will they get their money's worth?

Mr. ROBERTS. I can't conceive of a consumer who would worry much about an expenditure of 99 cents to $3 to attempt to control this thing. I can't believe that the motoring public would be too much concerned about that little cost when you compare that cost with the total cost of an automobile. I just can't imagine that there would be that much concern about it if it contributes in any way to the elimination of the possibility of a person having lung cancer.

I must say I think the fears of the automotive industry, if they are as you express them, are certainly not in keeping with what I believe the attitude of the consuming public to be.

Mr. Schenck.

Mr. SCHENCK. Mr. Chairman, first I want to express my appreciation to Mr. Richards for his statement, and also to the industry in general for their consideration and concern about the problems, even though they have been a little slow getting around to some results.

I would like to ask some questions, Mr. Richards.

Is it true that many of these gases which are considered harmful are heavier than air?

Mr. RICHARDS. I would like to ask Mr. Delaney to answer that.

Mr. DELANEY. I am not sure what you mean by harmful materials. I think there is some question—in fact, I know there is some question—about the physical effects of them. There have been identified in the exhausts of automobiles something over 90 different compounds,

and what the effects of those compounds are on the health and plant damage and so on, I don't think has been very well established.

Answering your question, some of them are heavier than air.

Mr. SCHENCK. Aren't most of the exhaust gases heavier than air harmful or not? In other words, disregarding the question of harm to human health.

Mr. DELANEY. As I say, there are so many in there that I would hesitate to answer. I frankly don't know whether most of these 90 are heavier than air or not. I would have to check on the percentages of each before I could answer.

Mr. SCHENCK. I think this committee had some testimony by some of the engineers of the automotive industry indicating that these gases are heavier, and that was given as one reason vertical exhaust pipes above the cars was of little or no value, other than to get the noise up and off the road, because the gas would settle on the roads anyhow.

Since many of our metropolitan areas in particular have narrow streets and high buildings, they become chasms or just like tunnels without a roof. It is my understanding that this problem is true even in the maze of streets and highways coming into downtown Detroit that are filled with exhaust gases, and which are not cleaned up because they are not touched by winds. It is my understanding that the city of Cleveland is now in the process of building a circumferential depressed highway around the downtown area. Many of the people there are becoming concerned about this aspect of exhaust gases.

Is your instrumentation for testing these various gases and the efficiency of the carburetion and other systems sufficient for you to feel that they are now adequate?

Mr. DELANEY. They are adequate for skilled technicians. They are not adequate for service stations or garages and mechanics.

Mr. SCHENCK. Then the instrumentation which has been developed would be of little value to the average garage owner or operator who is doing tuneup work and who is also trying to do something about the emission of some of these gases; is that true?

Mr. RICHARDS. Mr. Schenck, I think there is an interesting point there. The industry is putting up the money for an experimental inspection station in Los Angeles, which will try to determine some of these problems of inspecting the vehicles and measuring the emissions as a practical problem. I think out of that will come better information in answer to your question.

Mr. SCHENCK. Better instrumentation?

Mr. RICHARDS. Better instrumentation and more simplified instrumentation, that could be used by a nonscientific employee.

Mr. SCHENCK. Do I understand your reference here to photochemical process has something to do with the effect of sunlight upon the exhaust gases in creating different compounds?

Mr. RICHARDS. It is the theory—and I say theory, but it is generally accepted, the Hoganschmidt theory—the photochemical smog is the unburned hydrocarbons in combination with oxides of nitrogen and baked by a hot sun which creates the Los Angeles smog, that irritating chemical combination that is so objectionable in that city. Unless you have conditions comparable to the conditions that produce that, you don't get the photochemical smog. It happens on still days very rarely in other sections of the country when due to other condi-

tions; these things are held without movement or not broken up and acted on by the sunlight, you get an irritation which reminds you of Los Angeles.

Mr. SCHENCK. I was interested in your statement here on page 4 where you say that the devices upon which you have commented can be made available for any other area.

The chairman referred to that. It is my impression that the people of the United States are a very mobile people. We have somewhere near 60 million automobiles on the roads today, or vehicles of all kinds. The people travel freely from State to State, and area to area. Therefore, isn't it just as essential that an automobile which is purchased in a small rural community be equipped with proper exhaust control devices as any other area, because it is very likely that automobile will be driven into many different areas? Isn't it just as essential that all automobiles be equipped with these devices.

Mr. RICHARDS. Mr. Schenck, that is the very difficult problem that the California Legislature will face next month. The so-called "cow counties" of California are not convinced that they should bear a heavy expense when they are not faced with an air pollution problem. Vast areas of the United States are not faced with air pollution problems, as we understand them now. I think you would have to make a very clear case of need to sell that to the American public, and I think there is where we are today. We don't have that clear case. We are jumping from one assumption to another. We don't feel at this point we know enough about air pollution in general to take that jump.

Mr. SCHENCK. Mr. Richards, automobile purchases have no choice at all as to whether or not they want fins on their rear fenders or whether they want some sort of sculptured steel design, because that is the decision of the manufacturer designing his car into what he thinks will make it attractive and salable. So a manufacturer is perfectly willing to do those things, to add chrome here or there, or to change the design and shape of the car to make it more salable, but seems to be reluctant to add safety features. It has been said that the tail pipe of the automobile can well be the most fatal and dangerous part of the entire car.

Mr. RICHARDS. Mr. Schenck, I don't believe this popular attack on the manufacturers is justified. When a decision is made to build a certain type vehicle for sale to the public, that decision usually involves hundreds of millions of dollars of investment. They put that out on the table and the public votes as to whether their decision was right or not. Our responsibility in the AMA is not for the sale of vehicles. I have great admiration for the courage of these companies who make their decision and put their money on the line. The public does have some choice. There is real keen competition. The judgment of the companies tries to follow the public demand in matters of styling. Sometimes they make a mistake. Sometimes someone comes up with a different idea, and they are able to make inroads into this competitive industry that they could not otherwise make.

On the safety field that happens to be an area where I have spent a great deal of time, and there is not a reluctance on the part of manufacturers to put proven safety devices on the vehicle. There

is a reluctance to let people decide, some people who think they know what is safety and what is not, and say you shall do this. The development of safety devices has followed a very sound and logical procedure of testing and trial. When they are proven, they have become a part of the vehicle and all manufacturers follow it. Safety glass is an indication and various brakes and better vision, the automatic and powered brakes, and power steering and all of these things, which have gone through these processes of testing.

There are questions on some of the safety devices that people say, why don't you put them on all cars. The case is not clear. If it were a clear case, you would see it all put on. It is in the process of development. That has been a very interesting development. We had at the golden jubilee of the industry in 1946 a very impressive demonstration by the Society of Automotive Engineers of safety development in the vehicle from its beginning to the 50-year period of 1946. It was a very impressive demonstration. I think the industry can be proud of what it has done and that process is being accelerated today by the fact that we have greater facilities in research and testing than we have ever had and competition is greater. The pressures are greater.

Mr. SCHENCK. Mr. Richards, I certainly would not want to indict the industry for their desire to develop beautiful automobiles, and well designed automobiles and attractive automobiles and automobiles which operate easily and so forth. You will recall that in the basic price of an automobile, if you are going to buy one, you go to a dealer, and he will say the basic price of this car is X dollars. Group A accessories, which include backup lights, turning signals, electric windshield wipers, et cetera, will cost you so much. Delivery is so much and tax is so much. So here is the basic car plus these group A accessories.

Now, if you want power brakes, we have them. They are so much. If you want power steering, we have it. It is so much. If you want automatic transmission, we have it and it is so much. If you want air ride, we have that. It is so much. We have padded dashboards at so much additional. We have padded visors at so much additional. So now we are coming up with another accessory for the efficient operating of the automobile and in the interest of public health, not just the people who are riding in the car, but the people who are riding in the car behind the car.

Now we will say to them, we will be glad to put one of these devices on your car for $10, or we will furnish a kit for an older car for $15 to $30. We will do this in California. We will do it elsewhere if you can show a need or if you want the connection on your car.

Yet when my bill was up before Congress earlier, which not only instructed the Surgeon General to develop certain standards, but to enforce the standards, the industry as a whole opposed it with everything they could throw into it. I don't believe that is in good public interest.

Mr. RICHARDS. I think maybe I can illustrate this point. You mentioned turning signals. We work very closely with the motor vehicle administrators and other public officials on safety matters. After some years of experience, it was concluded that turn signals were valuable. There were a lot of people in the meetings that we held that

raised the point, well, a turn signal sometimes is misinterpreted. It is turned wrong. The hand out of the window is the surest way. As the result of experience and a lot of discussion, it was concluded that turn signals were definitely a safety factor.

Mr. SCHENCK. But they are not part of the standard automobile and figured in the basic price.

Mr. RICHARDS. Let me illustrate this point. We agreed as an industry that all new vehicles as of a given date would be equipped with turn signals. Laws were introduced in various States and I communicated with the motor vehicle administrators of those States and said there is no need of passing this law, we will furnish that as standard equipment on the vehicle. Then the problem came with our dealers. They said we would prefer having it required by law, because we are under indictment here for loading vehicles with unnecessary equipment and equipment the customer does not want. So we let the States go ahead without any comment passing laws to require turn signals.

Now, turn signals are on all vehicles that come out of all of our factories. But how they are listed in the sales may depend on the problems of selling.

Mr. ROBERTS. Will the gentleman yield?

Mr. SCHENCK. Yes.

Mr. ROBERTS. When was safety glass first installed in automobiles?

Mr. RICHARDS. That was in the twenties.

Mr. DELANEY. 1928, I believe.

Mr. ROBERTS. If I remember correctly, and I may be in error, wasn't it necessary that be done by State law before safety glass was installed?

Mr. RICHARDS. As a matter of fact, the State law picture, and we are having a little problem now—I was up in Boston the first of last week at a legislative hearing there where a bill had been introduced to prohibit the use of tempered glass and permit only the laminated glass to be used in the motor vehicles, and we had to go into the history of this starting back in 1934, when the uniform vehicle code had a provision on the use of safety glass. At that same time the American Standard Association effort to develop a standard, and in 1938 the standard on safety glazing material on motor vehicles was developed. That standard recognized heat-treated glass and laminated glass both as safety glazing materials, acceptable for glazing in all parts of the motor vehicle except the windshield, which was left only to laminated safety glass, because a fracture of the tempered glass would give you an opaque surface, and you would lose your vision.

The State laws were passed to recognize the national standard of the American Standard Code so that we would have the same law in each State, and not have to build vehicles for one State different from another State. That national uniformity you can recognize as important. All the States recognized the American Standard Code on safety glazing material. So that today the vehicles coming out of Detroit, some using one and some using the other are acceptable in any jurisdiction.

Mr. SCHENCK. Mr. Chairman, I yield the floor.

Mr. ROBERTS. Mr. Rhodes.

Mr. RHODES. Mr. Richards, I would like to ask a question with regard to the second paragraph of the summary. Some mention of it

was made previously. You say the motor vehicle manufacturers know that air pollution problems differ widely, and believe each community should be studied carefully in order to establish specific requirments. What I would like to know is what can manufacturers do in this air pollution problem if every community requires a different solution?

Mr. RICHARDS. When we speak of air pollution problems in the community, you will find, for example, in California, where I have spent more time on the problem, you have one source in one area. For example, Senator Thompson out there pointed out in his area a brick plant seemed to be the main source of the air pollution. It depends on the industrial activities of the area. It depends on the topography and the climatic conditions as to what their air pollution problem is, and then solutions need to be developed around the problem itself. Pittsburgh's problem and St. Louis' problem that they worked on is an entirely different situation to Los Angeles.

Mr. RHODES. I realize that the problem differs in various communities, particularly where heavy industry adds to the gasses from the cars. But if changes can be made by the auto manufacturers to eliminate some of these gases, why shouldn't it be done in the public interest and for the public health? While automobiles may not cause serious air pollution, I can see no good reason why steps should not be taken promptly to eliminate whatever auto gases and fumes which are known to contribute to air pollution.

Mr. RICHARDS. Let me come back to my statement. In our work with Los Angeles, we accepted, as I said, the thesis that unburned hydrocarbons with oxides of nitrogen were at the foundation of the Los Angeles smog problem. We have specifically worked on reducing the unburned hydrocarbon emissions of the vehicle. We have no information that would indicate that unburned hydroearbons constitute an important part of the air pollution problem in any other major part of the country.

Mr. RHODES. Do you have any reason to believe that it contributes nothing at all?

Mr. RICHARDS. We have no answer to that, sir, with the information now available. I think it would be logical to assume that any of the emissions could constitute a problem.

Mr. RHODES. If they could be eliminated, can you see any good reason why the manufacturers should not take steps to eliminate them?

Mr. RICHARDS. We certainly have taken very pronounced steps in connection with California. As I pointed out, let me just develop that a little bit. The announcement in November of last year that we would undertake to make this device available on all new vehicles offered for sale in California no later than the introduction of the new 1961 models this fall, the fall of 1960, was a major decision. Most of our preparation for a new model calls for engineering that goes back a lot further than that. This called for unusual effort on the part of the manufacturers to meet this commitment. When we met this commitment in California, which was an unusual one, I would say—and I will ask Mr. Delaney to develop this—at this date with the closeoff on the engineering plans for the new models that it would be an absolute impossibility to make these things available on 1960 models for the rest of the country. Could you develop that a little?

Mr. DELANEY. I would certainly think it would be very questionable because the date at which tooling has to be completed is only 60 days or so away, and the production facilities that are necessary to produce anything in the volume that would be necessary to supply the whole industry can't be set up under a period of some months. So I will agree with Mr. Richards' statement to that degree.

Mr. RHODES. That is all. I want to thank you, Mr. Richards, for your informative statement.

Mr. RICHARDS. After this has been made available in California our statement indicates that if needed or wanted in other areas, it would be made available.

Mr. ROBERT. At that point, Mr. Richards, you say if needed or wanted.

Mr. RICHARDS. That is right.

Mr. ROBERTS. Who is to determine if it is needed or wanted in a particular State?

Mr. RICHARDS. I think we would have to differentiate on the wanted. I think that would be the customer. Anything we build is available to a customer on request. As to the need, the reference there was to the establishment of a need in any area where air pollution problems have been studied and the conclusion is that this need exists. We would do undoubtedly as we did in California, voluntarily offer it for sale in that area, if a recognized authority indicated the need. Such a need has not been indicated to us from any other area outside of California.

Mr. RHODES. Mr. Chairman.

Mr. ROBERTS. Mr. Rhodes.

Mr. RHODES. Don't you think Mr. Richards that the need goes a whole lot further than what the customer desires? Some customers may not be concerned about it. What about the public interest and the people who don't buy cars. It seems to me that the automobile industry should be concerned about the overall public health problem, and not just the car buyer. He is only a part of the public.

Mr. RICHARDS. That is why we divided it into two. The customer wants it, we will give it to him. If recognized authority indicates a need, we will do as we have in California. We were convinced that they had a need in the Los Angeles area primarily. Since it had indications in other California areas that there was a similar photochemical smog on a less frequent basis, but the fact that it was there, we took action and voluntarily agreed to furnish it for the State of California. There the authorities in the public interest, in the public health interest, indicated the need. The Legislature of California assigned to the Department of Public Health the job of setting up an ambient air standard, and the need in our opinion was clear in that case.

Pittsburgh, St. Louis, Detroit, other areas that have air pollution offices, none of them has indicated the need for the control of the unburned hydrocarbons.

Mr. RHODES. The public must depend upon its representatives in government to speak up for them on such questions. Members of Congress are receiving protests from their own constituents in regard to this problem. I think the same is true of various public health agencies and our State legislatures. The very fact that this matter is before Congress, and is the concern of public health departments in many

States, reflects public opinion in seeking a solution and in putting responsibility on industry and government in finding the aswer.

Mr. RICHARDS. Mr. Rhodes, I certainly agree with you, and our analysis of the situation at this point is more research, more facts. when you stop to think of what they have spent in Los Angeles to make their determination, we have no other part of the country and no other segment of the problem that has been given the intense study and research that the Los Angeles situation has been given. But the point we are pointing out is that it would be a public disservice to jump from the argument that what is good for Los Angeles must be good for the rest of the country. We don't think that follows.

Mr. RHODES. I am thinking of what good can come in eliminating harmful gases, so far as possible, from all new cars. It does not matter whether it is Los Angeles or some smaller community that is affected. If there are dangerous gases coming from automobiles, steps should be taken to eliminate them. I understand you have found a way to eliminate some of it. I want to commend the industry for what they are doing. I am sure they are concerned. But further steps and more effort should be made to eliminate this danger.

Mr. RICHARDS. Let me clarify this, because I don't think there is any difference. In our industry we have most of the adult population of this country as our customers. I think we have a common position with you representatives of the people. What is good for the people is good for the automobile industry, regardless of how newspaper people twisted that here in Washington. That is the principle on which we operate. We are sure that is the principle on which you operate.

But here is the point: When you burn fuel, you get certain gases, as you say, and certain components, and how these may affect the public health or which ones may be offending and which ones may be harmless, these are facts that we don't know. The unburned hydrocarbons are villains in Los Angeles. We don't know that they are villains in Washington. We don't know that. When you burn them you get certain other things that may be more villainous in other areas than the unburned hydrocarbons. These are technical questions that we don't think anyone has developed the answers to. So jumping from Los Angeles' solutions to Washington or New York or Philadelphia, we don't think is justified without more knowledge than we are aware of today.

Mr. RHODES. I agree that you must go ahead with understanding. You certainly ought to first know what you are doing. From your testimony I took it that you have discovered a way to eliminate some of these gases.

Mr. RICHARDS. When you burn these unburned hydrocarbons that are coming out of the crankcase that are burned 100 percent by this device, or at least when they are put into the engine and burned, there is no increase in unburned hydrocarbons coming out of the tailpipe. When you do that, you create other things when you burn them. It was determined that in Los Angeles these were undesirable. It has not been determined in other areas that they are undesirable.

Mr. RHODES. If they are undesirable in Los Angeles, wouldn't they be undesirable almost everywhere else?

Mr. RICHARDS. No, that does not follow. I think it is a very open question as to how undesirable they are.

Mr. RHODES. They certainly would not do any good in any community, would they?

Mr. RICHARDS. My personal view on that is that I like the high mountain air.

Mr. RHODES. If they could be eliminated, however—I don't know whether you can—without any great expense, it seems to me it is only commonsense that steps should be taken to do so.

Mr. RICHARDS. I think you first have to determine whether it is offensive. All of the things that come out of the exhaust of motor vehicles are different. In an analysis they would all probably be rated differently. The elimination of some would be a priority. The elimination of others would be of less consideration. We know this: That you can't burn fuel without producing different compounds. You are going to produce these and we don't feel that the subject is thoroughly understood today to the point that we are justified in putting expense on our customer in all areas of the United States.

We urge again, and I think this is a very sound approach, research. We urge gaining more exact and good knowledge on which we can base our further research. We need that. We need it for areas other than the California area.

Mr. RHODES. I am for that. I think it is very necessary.

Mr. SCHENCK. Would the gentleman yield for just one question?

Mr. RHODES. I will yield the floor.

Mr. SCHENCK. On the basis of your judgment, Mr. Richards, is the Automobile Manufacturing Association now actively urging the U.S. Senate to act upon and approve my bill, which at the present time in its watered down condition provides only that the Surgeon General conduct the research and report to the Congress within 2 years as to exhaust gases he finds are harmful to health? Are you actively urging the approval of that legislation?

Mr. RICHARDS. I don't know how much action the individual companies are taking on that, Mr. Schenck.

Mr. SCHENCK. I am talking about the Automobile Manufacturers Association. You have just said you need a lot of research.

Mr. RICHARDS. Yes, more information is needed.

Mr. SCHENCK. Are you doing anything to encourage that type of legislation?

Mr. RICHARDS. We have not taken any action that I know of.

Mr. SCHENCK. Thank you.

Mr. ROBERTS. Mr. Devine.

Mr. DEVINE. Mr. Richards, would this be an accurate summary of the general position of your industry: Until you have conclusive proof of the need for some type of device to eliminate these noxious gases, odors, and unburdened hydrocarbons, that your industry is not going to be stampeded on making this mandatory equipment on, say, 7 million vehicles across the Nation?

Mr. RICHARDS. I think it would be correct to say that until we have more information and more assurance, or until appropriate authorities wish to take the responsibility for the results. In Los Angeles we take no responsibility for the control of smog in Los Angeles. We are only taking the responsibility of doing what we can with the motor

vehicles to eliminate the things that have been pinpointed to us as objectionable in that situation. What the results will be, we don't know. We haven't enough information. But the authorities in that State and in Los Angeles particularly have told us, "You are the offenders. If you can reduce hydrocarbons, we can control this situation and bring it to tolerable control." So we are cooperating to that end.

Mr. DEVINE. I guess you would call it cooperation. At least your industry is satisfied that as far as the Los Angeles area is concerned, it is sufficiently conclusive that you are going ahead in that area.

Mr. RICHARDS. That is correct.

Mr. DEVINE. But you find it is inconclusive elsewhere in the Nation, at least at this point, but you are conducting further research.

Mr. RICHARDS. That is right.

Mr. DEVINE. I find a general reluctance on the part of witnesses appearing before congressional committees to be critical of anything in government. I think you have been reluctant, too. Isn't it a fact—again not you individually, but your industry—your resistance to Mr. Schenck's bill or legislation of that nature is that you feel under the judicial free enterprise system of this country that industry itself can do a better job in this than some bunch of bureaucrats that will be studying and using public funds. I know you hate to say that on the record. I am asking you if that is an accurate statement.

Mr. RICHARDS. Of course, you recognized that was a loaded question.

Mr. DEVINE. It was not intended to be.

Mr. RICHARDS. Certainly we feel that government has its proper role and we defend with great vigor the forces of our industry which is the freedom to compete and the freedom to do research and not to be tied down. One of the things we object to is government designating, for example, the design objectives of our vehicles, rather than the performance objectives. That is a basic principle.

Mr. DEVINE. To boil it down, you feel sincerely and perhaps properly that private industry can conduct their own investigation and come up with adequate results to protect the general health of the citizens of this Nation, in the field of automotive industry, better than a bunch of Government employees and other people I think you described who think they know the answer to these safety questions.

Mr. RICHARDS. I think the answer to this—and this happens to be the area where I have a major responsibility with my industry—I feel very strongly on this point, that the answer is intelligent cooperation between those who have responsibility, and not interfering with their responsibility, but capitalizing on it so that you can move forward in the public interest. I spend a great deal of my time and my industry spends a great deal of money working with the public officials in the complicated problems of highway transportation. I think we have had signal success. I am very complimentary toward the Government officials, and we do not depreciate them in their proper field. We do resist when they try to tell us how to build motor vehicles. If they were able to do so we would rather hire them and bring them into our organizations. We think they have their role.

Mr. DEVINE. The key to your remarks would be, then, in their proper field.

Mr. RICHARDS. That is correct.

Mr. DEVINE. I have just one other thing in passing. I learned much to my surprise—I am new on this committee in that I came to Congress last year—in the automobile industry, and you know your business and I don't, that the designers design the automobile and then the engineers have to engineer to fit the design. That came to me as a great surprise. I thought that probably engineers would decide what should be proper in the automotive industry and then the designer would build around the engineers. Am I inaccurate in that?

Mr. RICHARDS. Let me call on someone who knows more about this, Mr. George Delaney, who was the chief engineer for the Pontiac Division of General Motors. He has been president of the Society of Automotive Engineers, and has had experience in this field. I think he might give you an answer that would be enlightening.

Mr. DELANEY. Mr. Devine, that is a problem of cooperation, somewhat similar to the one that Mr. Richards referred to moment ago. In other words, you can't say that any one individual or any one group of individuals design an automobile.

I might say parenthetically that some years ago I had a talk that lasted about an hour that I used to give to very interested groups on designing an automobile, which covered exactly your question. The management lays down the basic ground rules. In other words, the price class that the vehicle is to be in, general characteristics, merchandising characteristics, things of that nature. Probably the number of body types, sedan, hardtop, and so forth. The designers—I suppose when you refer to designers, you refer to what we ordinarily call stylists. They are the external people. Ordinarily the engineers give them some basic ground rules that they must style around. In other words, usually the seat locations, the headroom is determined by the engineers. The stylists can wrap a shell around that, but he has to maintain certain basic dimensions, leg room, headroom, seat location, and so on. The same thing for the engine compartment, the same thing for the wheelbase. There are a number of things that are basic that are laid down by the engineers. Then the stylist starts his work.

As he progresses with his work, he has certain modifications which he proposes to the engineer. The engineers say whether they are practical or not. In other words, there is a continuous interchange of information between the two groups. They are not actually two groups. They are one group working together all the time.

At the same time the engineer and the stylist are working with the production people on the effect on cost of all of these things. Every little detail that goes in there has some bearing on the final cost. That is probably one of the ground rules laid down by management, that it must fall within a certain cost bracket. The answer is not as simple or as trite as saying that this man or this group is responsible or this group is responsible. The entire organization is responsible.

Mr. DEVINE. It was my understanding that this was one of the great objections of the engineers in the automotive industry, that the stylists would say here is what we are going to sell, engineer it.

Mr. DELANEY. I don't know where you got that information. In my many years in the automobile industry I have always had excel-

lent cooperation with the stylists. I hope the stylists thought they had good cooperation from me. They worked on the design of the vehicles that I was responsible for. They worked under my supervision. I had the authority, with the support of my management, to overrule them at any time I thought they were doing something that was unreasonable or undesirable.

Mr. DEVINE. Thank you. That is all, Mr. Chairman.

Mr. ROBERTS. Mr. Brock.

Mr. BROCK. Yes, Mr. Chairman.

Mr. Richards, you have stated in your testimony that you realize there is a problem in California, and particularly in the Los Angeles area, and that the Automobile Manufacturers Association is taking steps to alleviate that problem. Now I would like to present another picture to you. Do you realize that there is automobile traffic to a great extent in every city in the United States? I live out in Alexandria. I drive a new model car and in order to get air into the new model car, I get it from the front portion of the car down near the front tire. I would like to take you from the House Office Building this afternoon to my home in Alexandria, and it would be necessary that on occasion you, riding with me, would need to come to a halt behind a truck or a bus spewing out great volumes of diesel smoke. I think that you would tell me on arriving at my home in Alexandria that you have never suffered so much irritation as the irritation that you would suffer driving in just 8 miles or 7 miles of traffic. You would say to me, I am sure, "Congressman, there must be millions of people who are traveling the streets of the United States and the cities that daily suffer the irritation that you must suffer."

I don't believe it would take a great group of scientific men to inform you that even though these gases may not all be cancer producing, they are certainly irritants. I would think that you would tell your engineers of your association that we could alleviate that problem by a vertical installation of the tailpipes. I believe that you would do it if you would ride with me to Alexandria this afternoon. I believe you would do it if you would follow any bus or any truck in any city in the United States, whether they have a smog problem or not. I don't know the difference in expense of a vertical or horizontal tailpipe, but I know that the general public would be absolutely happy with you if you would sit down with your engineers and say that tailpipes are going to be vertical now.

We heard some colloquy this morning about whether or not gases were heavier than air. I realize that some of these gases no doubt will come down and will become irritants. But they won't become irritants in the volume that they are when my car comes up behind one of these buses, and gets this blast of gaseous fumes from one of these buses or trucks.

Mr. RICHARDS. Mr. Brock, let me just say a few words on this problem because it is one we face in the States a great deal. The question of where to emit the exhaust gases is one that has been given a lot of consideration and a lot of study by the industry. I have taken a film that was produced by General Motors & Coach to many State legislators, to show them exactly what is involved.

It is not a question of whether you emit the fumes at the top or whether you emit them at the bottom. You emit them at the place

where they will be dispersed and mixed through turbulence with the air. The location of that exhaust pipe differs with many of the State laws. Many of the State laws would demand that the tailpipe extend beyond the rear of the vehicle. The studies on given vehicles would indicate that the turbulence which would mix that up and keep it from being concentrated would be better at another location in the vehicle. So we are asking the States not to legislate on the subject, and tell us where it will be, because in one vehicle it may be better behind the rear wheel or behind the vehicle, and in another it may be better in front of the rear wheel, and in some cases it is better in front of the vehicle. We feel if they would leave the engineers testing each type of vehicle to choose the best place for the dispersal of the exhaust, it would be better. Actually the overhead exhaust in all of the tests is not a desirable one and cities mainly that have asked for it for buses, we have been able to show them that is not the desirable place, because it is sucked in by the motion of the truck or bus or vehicle itself, and a better location is at the bottom. That is a matter of long study, and we would be happy some time to show you this film, which illustrates the fact that the overhead is not correct.

You are talking of a problem on expressways. This is a change in the traffic with new conditions. I would like to ask Mr. Delaney, if he might have a word on the importance and the amount of consideration that is given to the changes in our traffic pattern in engineering a vehicle.

Mr. BROCK. Before we go into that, Mr. Richards, wouldn't you admit today that there is less irritation to the general public in traffic with the emitting of the gases from the tailpipe in vertical position than from the emitting of gases from a horizontal position behind the bus or truck?

Mr. RICHARDS. I would say that from the experimenting and testing of our member companies, and all the evidence they have given me, the answer to that is no, it would not. The overhead would be a disadvantage to the public and would not accomplish the purposes that you anticipate.

Mr. BROCK. I don't believe that the general public would agree with that, though.

Mr. RICHARDS. I don't know about that. I know that this comes up periodically, particularly with respect to buses in communities all over the United States, and we send them information. The answer is not in an opinion. The answer is in the actual testing, and the testing does not support the theory.

Mr. BROCK. Did you have anything to add, Mr. Delaney?

Mr. DELAEY. I don't believe so. I think Mr. Richards has covered it.

Mr. BROCK. That is all I have.

Mr. ROBERTS. The gentleman from Minnesota.

Mr. NELSEN. I wish to thank the gentleman for his very patient testimony. I was curious about the attachments that you have on the witness table there. The one is below the carburetor and above the manifold, is it not? Could not the manifold be designed with a hole that is drilled and plugged which would make it very inexpensive to provide the draft to your crankcase breather, instead of going through the expense of providing a complete attachment like that, or does it go to several barrels in the manifold?

Mr. RICHARDS. Yes. As I mentioned earlier, the various companies in adapting this basic below-carburetor system will do it in different ways. Depending on the characteristics of their engine. I think Mr. Delaney can probably answer that question more satisfactorily.

Mr. NELSEN. The reason for venturing that conclusion is this: Many farmers have a manifold drilled on their farm tractor, and in the event of electric power in the farm to start their tractor, draw from the manifold of the tractor to the milking machine. It will create 20 inches of vacuum on your milking machine line. So it would occur to me if there was a manifold cast with these very inexpensive openings, and then attached to the breather of the crankcase would not create an additional expense of great size.

I would further make the observation that I was concerned about the reference to the other gadget which is above the carburetor. I happen to have a 1952 Henry J. Kaiser at home, and it runs so nicely, and I am wondering when this carburetor is going to varnish up. It is going fine still. It is quite amusing, because that very gadget is on that old car of mine at home, and I have seen it on no other models.

Now, back to my question.

Mr. DELANEY. When you drill a hole in the manifold or when you admit the crankcase fumes any place in the induction system, in effect you are admitting principally air. As we draw that through the crankcase it comes in the breather and circulates in the crankcase, and goes to the induction system. Unless that is mixed uniformly in the manifold, so that it goes to all cylinders uniformly, it will probably lean out one sylinder and cause missing. It is highly desirable to put it in such a manner that it goes to all cylinders. If you will look at this in detail, you will see this passage around here that accomplishes that. In other words, it conducts it to all sections of the manifold. In the case of the milking machine that you mentioned, I am not familiar with the details of construction there, but I don't think you use a great deal of air. It is a good deal the same proposition as a vacuum windshield wiper on an automobile, which is also hooked up to the intake manifold and the location of that is very important. But the thing there is that there is not much air being used. It is mostly vacuum, and the vacuum is the absence of air. That is the difference between those applications.

Mr. NELSEN. There is still hope for my Henry J.

Mr. RHODES. Mr. Chairman, if I may, I would like to say that I think Mr. Richards has been giving us intelligent cooperation, and I am in full accord with what you have said. I certainly don't believe that any witness appearing before a congressional committee should be abused. I have the highest regard and respect for both of you. I must disagree, and I am sorry my friend, Mr. Devine, left, with his statement about bureaucrats. I realize there is good and bad in Government, and there is good and bad everywhere. But I have found particularly in the Public Health Service that these so-called bureaucrats are extremely good public servants and are doing a lot of good for the people of this country. If those people are not going to be interested in this kind of problem, who is going to be? I don't think this is just an industry problem. It is more than that. I say that with the highest regard and respect for industry representatives. I think they are concerned about the public welfare. There are, of

course, honest differences of opinion. Here is a place to express them and hope that we might find the proper answer.

Mr. RICHARDS. I attended the public hearing of the State Board of Health of California, and publicly announced our admiration to Dr. Smith and Dr. Merrill, who heads the department, of the very fine professional work that they have done in establishing an air standard. We have great admiration for them, and have worked very pleasantly, and I think effectively, with these men. We hold them in the highest regard.

We do recognize, however, that they are dealing in a new area, and they also admitted that, and that they might have to change their views as new data and new information develops. I would say professionally between our engineers and these public health men, and the same is true with the U.S. Public Health and Welfare Service, I think there is mutual confidence, our objectives are the same, and we feel we can contribute something from our industry viewpoint. As I say, my work is mainly with public officials, and I hold them in the highest regard. There are many outstanding people in that work that are devoting themselves to the public interest and we respect them for that.

Mr. RHODES. I thoroughly agree, Mr. Richards. Since I have been on this subcommittee I have had an opportunity to meet many of them and see the work that they have been doing. I don't think there is a finer group of people in this country than those in the Public Health Service.

Mr. RICHARDS. I agree.

Mr. ROBERTS. The Chair would certainly like to concur with the observation that the gentleman from Pennsylvania makes about the dedication and devotion of the people in the Public Health Service.

There is one thing that I would like to clear up before we leave, and that is, you mentioned this fact, and I may be wrong in this quotation. I got the impression that you had the idea that there was a group in Government or some Government employees seeking to tell the industry how to design automobiles. Am I correct? You said if they knew how to do it, you would like to employ them.

Mr. RICHARDS. I made reference to my long experience with the various States, and we have had instances where people have wanted to design our motor vehicles, and as I pointed out, we resist that because we know that it is not in the public interest. We ask when legislation or regulations are evolved that they indicate performance standards and leave the companies free to meet those standards in the best way they can in our competitive industry.

Mr. ROBERTS. That idea I had could have proceeded from the fact that I am a little sensitive on that point. I introduced a bill last year which was approved by the House, H.R. 1341, and some people have said that it is an attempt on the part of Government to tell industry how to design their cars. I have never held that view. I did not want the record to stand in any doubt about that question.

Actually, so far as I can recall the bill had the approval of the National Safety Council, the American Public Health Association, the American College of Surgeons, and the American Medical Association. If there is any idea that it was an attempt on the part of the Government agency to regulate the automobile industry, I hope you

will bear that in mind. It is not. I believe two-thirds of the Members of Congress were for that bill.

I might say also it looked at one time as if we would have complete approval of the entire industry for that bill. We did have the approval of some segments of the industry. I would still hope that we may succeed in getting industry's further consideration of it. I did not want to leave the record in doubt as to what you meant by your reference.

Mr. RICHARDS. Thank you, sir.

Mr. ROBERTS. I would like to join with other members of the committee in commending you gentlemen for being very cooperative in our hearings, and having done your best to give the information you had.

This will conclude the hearings for today, and the subcommittee will stand in recess until 10 a.m., at this same hearing room tomorrow morning.

(Thereupon at 12:10 p.m., a recess was taken until Wednesday, February 24, 1960, at 10 a.m.)

AIR POLLUTION CONTROL PROGRESS

WEDNESDAY, FEBRUARY 23, 1960

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE OF HEALTH AND SAFETY,
OF THE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to recess, at 10 a.m., in room 1334, New House Office Building, Hon. Kenneth A. Roberts, chairman of the subcommittee, presiding.

Mr. ROBERTS. The subcommittee will please be in order.

We have with us this morning Congressman Saund from California, who is deeply interested in this question of air pollution. At this time the subcommittee will be glad to have your statement, Congressman Saund.

STATEMENT OF HON. S. D. SAUND, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. SAUND. Thank you, Mr. Chairman.

Mr. Chairman, I appreciate this opportunity to make a few remarks concerning air pollution control. Smog has become a menace in my beautiful area of southern California. The largest city in my district is Riverside, and it is 50 miles east of Los Angeles. Yet this floating poison drifts out as far as Riverside. It has been demonstrated that this smog is a deterrent to health. Also it has caused crop damage. Riverside County officials have become so alarmed that they have set up machinery for smog control. As a result we are extremely interested in any help that the Federal Government can give in this problem.

I wish to request permission to extend my remarks.

Mr. ROBERTS. Thank you, Congressman. We are always glad to have you before the subcommittee. I have only one question. I would say from your statement that you think that air pollution is not strictly a Los Angeles problem.

Mr. SAUND. No. I believe if nothing is done about it, it won't be long before it goes as far as Palm Springs.

Mr. ROBERTS. Thank you very much.

Mr. SAUND. Thank you, Mr. Chairman.

Mr. ROBERTS. The next witness is our colleague from California, the Honorable Gordon L. McDonough. Mr. McDonough, we will be glad to hear you at this time.

58838—60——5

STATEMENT OF HON. GORDON L. McDONOUGH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. McDONOUGH. Mr. Chairman, I want to thank the committee for this opportunity to express my views in favor of the proposal to find a smog-free automobile muffler, or other device in the design of the automobile engine to prevent the elimination of any substance that contributes to air pollution.

I hope that committee action will stimulate the interest of the automobile manufacturers to make this type of muffler or other smog-control device standard equipment on all automobiles.

It is an established fact that automobile exhaust is a major cause of air pollution not only in the Los Angeles area and southern California, but throughout our Nation—and that it results in excessive smog to the detriment of the health and well-being of our citizens.

The air pollution problem is so serious and so complex that its solution must be the responsibility of government at all levels, National, State, and local, and only through the maximum effort of all agencies concerned as well as the cooperation of the public can we hope to attain our ultimate goal of the elimination of many sources of air pollution and maximum control of those for which complete elimination may not be possible.

Los Angeles, Calif., in which my own 15th district is located, is one of the areas in the United States where the problem of excessive smog has become chronic and has reached levels of air pollution which are dangerous to the health of the residents of the area.

With the continuing phenomenal increase in population in Los Angeles County, the problem of air pollution becomes increasingly serious. In this area our residents commute from suburban areas 20 and 30 miles distant from the city daily, and the problem of smog control is not limited to domestic and industrial sources, but includes the problem of noxious gases produced from some 3 million automotive vehicles traveling our roads and freeways.

We must breathe air to live. And we must control air pollution and eliminate as many sources of air pollutants as possible if we are to protect the health of the American people.

Progress has already been made in the field of air pollution control. We have established some of its major sources as well as discovered some of its immediate effects upon human health.

Sources of air pollution in some fields have been reduced. Better methods of measuring and identifying air pollutants have been developed, as well as methods of control to prevent disaster in the event of sudden excessive air pollution in heavily populated areas.

But there is still much to be done both in the field of research and of control. Also with the continuing rapid growth in population in many areas of our Nation and industrialization, and also in the greater use of atomic power for peacetime uses, new sources of air pollution may develop which must be identified and controlled or eliminated.

We know that automobile exhaust is a major cause of air pollution, and it is time that effective action be taken to eliminate this cause of smog at its source, the automobile engine. The automotive industry has the know-how to produce either an effective exhaust for auto-

mobiles which will eliminate any substance which would pollute the atmosphere, or an automobile engine designed to completely combust fuel within the cylinder.

If the automotive industry fails to act to eliminate the source of air pollution from the automobile engine, then the State and National Governments will be called upon to enact legislative measures to require smog-control devices on all motor vehicles.

Such legislative measures are already under consideration in the Congress, and are being brought to the attention of the California State Legislature.

I introduced a bill to require smog-control devices on all automobiles, and my bill, H.R. 1297, is currently pending before this committee.

It is inevitable that smog must be controlled, and that necessary smog-control devices be equipped or installed in all motor vehicles in the process of their manufacture. It is only a question of whether the automotive industry shall accept the responsibility for this improvement in the automobile engine, or whether a smog-control device must be required under Federal or State law.

Mr. ROBERTS. Are there any questions? If not, we thank you for your testimony, Mr. McDonough.

Mr. MCDONOUGH. Thank you, Mr. Chairman.

Mr. ROBERTS. Our next witness this morning is Dr. Arthur S. Flemming, Secretary of the Department of Health, Education and Welfare. The chairman would like to welcome you, Dr. Flemming. I know you have a busy schedule. We are always glad to have you, and have you appear before our subcommittee. Before we get started, I have a statement here that has been sent to the committee by Senator Richard L. Neuberger, who has shown a great interest in this problem, and I believe that Mr. Shane is here at this time. We will be glad for him to offer this statement to be included in the record. Mr. Shane.

Mr. SHANE. Senator Neuberger deeply regrets that he is unable to be here in person to testify before the Subcommittee on Health and Safety, but he is currently in Oregon where he is following the instructions of his doctors to take a few weeks of rest to overcome recent attacks of virus infection. In his absence, I wish to present this statement which he has prepared, and also three insertions that he would like to have incorporated into the record.

Mr. ROBERTS. Without objection, the statement and attachments will be included in the record. Thank you, Mr. Shane.

(The statement referred to follows:)

STATEMENT BY SENATOR RICHARD L. NEUBERGER

Mr. Chairman, air pollution is an economic burden and a health hazard. Its costs and its danger grow with population and industrialization. Individually, none of us can do much about air pollution. Collectively, through Government, we can take effective action to eliminate or control it. Your subcommittee will help to determine the correct direction for further public action.

In 1955, Congress approved a Federal research and technical assistance program to help combat air pollution; this legislation authorized appropriations of $5 million a year for 5 years to the Public Health Service to study the problem. The law was extended for an additional 4 years in the last session.

Research concerning auto exhausts is a major element in the air pollution medical program of the Public Health Service. Cancer, bronchitis, asthma, and heart disease have been associated with urban smog. The primary cause of

smog is incomplete combustion. A major offender is the automobile. In a report submitted to me last year, the Public Health Service identified automobile exhaust as "probably our most important" problem in the field of air pollution.

STUDIES NOW UNDERWAY

A number of studies are now underway in the Public Health Service in connection with air pollution by auto exhausts. They deal with these general questions: What are the toxic effects of auto exhausts? To what specific constituents of exhaust are these toxic effects due? What are the time and concentration variables involved in these effects? What can be done to prevent or treat these effects?

Answers to these questions are important. Congress should give full support to this program. But I do not believe that this program in itself adequately serves the public interest. I think that Congress should:

1. Direct the Surgeon General to determine, after conducting such research as may be necessary, standards as to the amount of unburned hydrocarbons and noxious gases which is safe from the standpoint of human health for a motor vehicle to discharge into the atmosphere.

2. Authorize the Public Health Service, following establishment of these tolerance limitations, to assist in the development of an effective and practical device to control discharges from motor vehicle exhausts within the limits of such standards.

3. Approve any appropriate legislation to insure that motor vehicle manufacturers install this device on machines produced after a specified date.

WHAT ABOUT THE REST?

Recently the auto industry announced that beginning with model year 1961 manufacturers will install on all cars offered for sale in California an inexpensive crankcase device which will lower by about 40 percent the amount of unburned hydrocarbons released into the atmosphere by motor passenger vehicles. I wrote to L. L. Colbert, president of the Automobile Manufacturers Association, asking why installation was being restricted to cars to be sold in California. Mr. Colbert has since assured me that the device will be available to car buyers in other parts of the country—as optional equipment. Cost of installing the device is estimated to be as low as 99 cents.

Utilization of this device is perhaps not of paramount importance in terms of public health; PHS experts have reservations concerning its ability to deal with identifiable health-hazard compounds. The exhaust fume purifier is still looked to as the efficacious way to reach this problem.

Control over the decision as to whether or not to utilize this device is of paramount importance. Los Angeles has been successful in jarring the auto industry into action in California. Areas troubled with similar problems have not been so successful.

PROBLEM IS SERIOUS

The problem of pollution of our air by auto exhausts is a serious one. I do not believe that its solution can be left to the whims of auto designers who seem more concerned with fins than fumes. The public interest demands that Government take necessary steps to protect its citizens.

The automobile industry reports that it is spending about $1 million a year on research designed to perfect a method of effectively reducing motor vehicle exhaust fumes. Several approaches are under study. They include a low-temperature catalytic converter, a muffler device utilizing high-temperature catalysts, and a flame-type afterburner. Employment of these devices will reduce hydrocarbon emissions 60 to 90 percent, engineers state. It is estimated that such devices might be produced and installed for as little as $150.

But little tangible in the way of a commercial exhaust reduction device has been presented to the public by the automakers.

Congress has authorized funds to find out what should be done to curb auto exhaust air pollution. Now we should provide the direction and tools to see that it is done. Last year the Secretary of the Department of Health, Education, and Welfare declared that "we have no doubt as to the ultimate desirability of developing and publishing standards or criteria relating to concentrations of various contaminants in the open atmosphere, including those derived from the exhausts of motor vehicles."

PROPOSAL RECOGNIZES REALITY

However, he also pointed out that "research experts who are now working on this problem in this Department advise that the scientific information required to justify and furnish the quantitative basis for the establishment of health protection standards for unburned hydrocarbons and noxious gases in motor vehicle exhausts is not now available."

My proposal recognizes this reality. It requires establishment of standards only after the Secretary has determined that research is sufficiently advanced to support such action.

Although the standards obviously could not be issued immediately, I think it is important to provide the Public Health Service with an explicit mandate.

Similarly, application of the standards will require a device capable of reducing the amount of pollutants emitted by auto exhausts to the specified safety point, and my proposal would direct the Department to assist in hastening this achievement.

STRONGER PROGRAM REQUIRED

Compliance is the next step. In my view, this will require an act of Congress outlawing the use in interstate commerce of any vehicle violating the standards set up by the Public Health Service. More information will be necessary than we have today to permit realistic drafting of such a statute.

On August 18, 1959, I introduced S. 2556, to accomplish the first two steps which I have recommended. My bill is presently pending in the Senate Public Works Committee. I know that this subcommittee has considered somewhat similar legislation in the past.

I believe that Congress must strengthen the attack against air pollution by auto exhausts. Enactment of this proposal would represent a significant forward step in that direction. Despite the efforts of the auto industry to "regionalize" the problem, it is national in scope. Its solution must be, also.

Mr. Chairman, I would appreciate your inclusion in the hearing record at the end of this statement of two articles and an editorial from the Washington Post and Times Herald concerning the crankcase device developed by the auto industry to reduce the emission of unburned hydrocarbons.

[From the Washington Post, Feb. 1, 1960]

INEXPENSIVE, SIMPLE: AUTO EXHAUST DEVICE REDUCES AIR POLLUTION

(By Morton Mintz, staff reporter)

A simple, very inexpensive device reduces by a significant amount the air pollution created by an automobile. But even if it could be universally installed now it would not be a panacea. Nor is it likely to delay the day when drastic steps against automobile-caused air pollution may be required in such metropolitan areas as Washington.

That is the substance of the first evaluation made by the U.S. Public Health Service since the Automobile Manufacturers Association announced the device November 30. The association said the device would be installed on all new cars offered for sale in smog-ridden California not later than the start of the 1961 model year.

In a Senate speech last week, Senator Richard L. Neuberger, Democrat, of Oregon, suggested that the automakers "give us all a break." He said he has proposed to the auto association's president, L. L. Colbert, that the device be factory-installed on every new car.

Neuberger told the Senate he could not understand why the Nation's cities should "receive less consideration by the auto manufacturers than the town of Weed, Calif., with a population of 3,403 persons living in a rural atmosphere."

No price on the device has been set, but indications are that it could be very low. S. Smith Griswold, Los Angeles County air pollution control officer, said a motorist could install one himself on a 6-cylinder car for "$1.99, including tax." On the assembly line the cost could be expected to be even lower.

Griswold estimated that a garage would charge $10 to $15 for such a job.

The PHS evaluation is preliminary, based on tests of only about 20 cars of varying age, condition, and make. But it will not be basically changed.

The PHS's cautious approach is not based on disagreement with estimates that the device removes an average of 33 to 40 percent of the total hydrocarbons

emitted by an engine. On this point it believes merely that it cannot yet calculate the precise reductions.

Its concern is, rather, with the following factors, cited by Vernon G. MacKenzie, Assistant Chief for Research and Development in the Division of Engineering Services:

The device feeds the "blowby"—normally vented into the atmosphere through a crankcase breather pipe—back into the engine to be burned. "Blowby" is the mixture of air and raw gasoline—which is composed almost wholly of hydrocarbons—that normally escapes past the piston rings into the crankcase.

The particular hydrocarbons suspected to be cancer producers are created in the explosion of air-fuel mixture in the cylinders. It is not likely that the device has any effect on them.

Nor can the device destroy the olefins created in combustion. Olefins are one of the two ingredients in sunlight-triggered smog. They comprise about 45 percent of the hydrocarbons in the exhaust stream. The device can destroy only those olefins present in the raw gasoline that flows into it, and the total of these is smaller.

Public Health scientists are increasingly concerned that smog is not merely an annoyance or a minor health problem, but that it contains substances that heighten the risk in many persons of lung cancer, emphysema, chronic bronchitis and asthma, and allergies.

Nor can the device destroy carbon monoxide, which is also created in combustion. In sufficient amounts, this poison endangers persons with heart and circulatory diseases.

Nor can the device destroy hydrocarbons emitted not by the engine but by evaporation from the fuel system. The point here is that there are many sources of hydrocarbons that no single device can get at. Roughly 10 percent of the gasoline dispensed in a city, for example, can evaporate during storage, handling, and marketing, all before it gets into automobile fuel tanks.

In areas with rapidly increasing auto registrations—Washington is one—the good the device would accomplish would be overwhelmed within several years, even if every car had it.

Despite the foregoing reservations, MacKenzie sees no reason to minimize the significance of the device. What the reservations really do, he said, is emphasize, instead, the enormity of the air-pollution problem.

In addition, he noted that the device offers a dividend. It is that in recirculating raw fuel back into the engine it destroys lead that is believed more toxic than the lead compounds created in combustion. The effects of the device on economy and smoothness of operation are believed to be very slight.

Still regarded as the most promising means of curbing automobile-caused air pollution is the exhaust-fume purifier. It would cost about $150 per car if installed at the factory and probably more if put on an existing car.

The smog problem is so great in California that Gov. Edmund G. (Pat) Brown is expected to ask the legislature to require installation of the purifiers within a year on all new cars sold in the State. Also under consideration is a requirement that the device would have to be on existing cars by 1965.

The purifiers would remove at least 80 percent of the hydrocarbons—including the carcinogens—and at least 60 percent of the carbon monoxide from the exhaust stream.

[From the Washington Post, Feb. 14, 1960]

NEUBERGER WANTS SMOG DEVICE ON ALL AUTOS

(By Morton Mintz, staff reporter)

Senator Richard L. Neuberger, Democrat, of Oregon, has been told by the auto industry that it will offer buyers of 1961 cars an inexpensive device that reduces automobile-caused air pollution—but as optional equipment.

Only on cars made for sale in California will the device be standard equipment. It was this stand taken by the auto industry that led Neuberger to urge universal new-car installation in a January 26 letter to L. L. Colbert, president of the Automobile Manufacturers Association.

Neuberger repeated his appeal yesterday after Colbert wrote him that the industry "will make the device available to anyone who wants it in any area of this country."

CALIFORNIA SINGLED OUT

In a letter released by Neuberger's office, Colbert, who is also president of Chrysler Corp., said the device "has specific application to the California smog problem" and contended that photochemical sunlight-triggered smog there "is a form of air pollution not likely to achieve (comparable) frequency and intensity * * * anywhere else on earth."

"Most people in the industry doubt that it would be appropriate to burden car buyers" elsewhere "with the added cost of a device for which there is little need," he said.

INSTALLED FOR $1

Neuberger said experts estimate that the cost of installing the device on the assembly line could be "less than $1."

Asking why the possible health advantages the device offers should not be extended to residents of all 50 States, Neuberger declared:

"Addition of less than $1 to the $2,500 or $3,000 cost of Detroit's product won't kill the car market."

The industry itself has not set a price for the device, which may be available in quantity even before the 1961 model year.

Representative Kenneth A. Roberts, Democrat of Alabama, has invited the auto manufacturers to give testimony on why the device should not be standard factory equipment. He has scheduled hearings of the House Interstate and Foreign Commerce Subcommittee which he heads for February 23 and 24. Like Neuberger, he considers automobile-caused air pollution a problem of all metropolitan areas.

PHS FINDS IT WIDESPREAD

The Public Health Service prepared a summary of its position for Neuberger last year that said:

"Automobile exhaust has been identified as the major known uncontrolled source of air pollution in several major metropolitan areas.

"Certain substances have been found in automobile exhaust fumes which are known to produce cancer in animals under experimental conditions * * *."

Photochemical smog contains irritants such as ozone that have caused fatal lung diseases in laboratory animals and made delicate membranes more vulnerable to carcinogens (cause of cancer) and infections.

Researchers have many times found ozone in tobacco fields at Beltsville, Md., at levels that Robert Porter of the PHS has termed "comparable to those found in severe smog in Los Angeles." The ozone drifts out to Beltsville (and elsewhere) in smogs created in District traffic jams. The fields are 6 miles from the District line.

"BLOW BY" IS FED BACK

The exhaust device destroys unburned hydrocarbons by feeding "blow by"—the mixture of air and raw gasoline that slips into the crankcase past the piston rings—back into the engine.

The PHS told the Washington Post on January 31 that it believes the devices significantly reduce the discharge of hydrocarbons, but not those hydrocarbons that are suspected cancer producers.

[From the Washington Post, Feb. 22, 1960]

MIGHTY LIKE A ROSE

One hardly needs a lot of scientific measuring devices to know that the modern motor car is suffering from halitosis (baited breath, dearie) in the worst way. No matter how dainty it may seem, no matter how healthful and hygienic the care of it has been, when it breathes (let's call an odor an odor) it stinks. Moreover, if one does bring those scientific devices around, one finds, as Reporter Morton Mintz told us all recently in an exhaustive series of articles on the exhaust problem, that the breath of even the most delicately nurtured automobile is chock full of carbon monoxide, undigested hydrocarbons and other noisome, noxious substances.

This has been going on for quite a long time, causing smogs and smells and maybe a little cancer here and there to boot, with no one but Senator Richard Neuberger willing to come right out and tell the automobiles that everybody's been gossiping about them and that they'd jolly better freshen up. There is a simple, scientific cure for their social handicap—a newly developed device which will make them as frangrant as hyacinths, which can be worn inside their crankcase breathers so that no one will ever know they've got one on and which can be installed in any automobile assembly plant at a cost of no more than $1 before the car makes her debut.

The Automobile Manufacturers Association has told Senator Neuberger, however, that it intends to include this purifying little gadget as standard equipment only on cars making their debut in California. Elsewhere it will be optional. California, it is true, has more smog than the rest of us. But olfactory senses are just as keen in other parts of the country; and the rest of us are just as allergic to hydrocarbons. This is, to be sure, a delicate situation. But if the auto makers can't take a polite and tactful hint, somebody's got to tell them right out to be more fastidious. Congress itself may have to acquaint them with the facts of life.

Mr. ROBERTS. Dr. Flemming, it is always a pleasure to have you before the subcommittee. I know of your intense interest in this whole question of air pollution, and you may proceed with your statement.

STATEMENT OF HON. ARTHUR S. FLEMMING, SECRETARY, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Secretary FLEMMING. Mr. Chairman and members of the committee, thank you very much. I certainly want to assure you that I appreciate the opportunity of appearing before you in connection with this very important subject of air pollution.

Last week I transmitted to the Congress a legislative proposal embodying amendments which are considered desirable to make more effective the Federal program in this field. I am happy to be able to discuss these suggestions with you and to outline our reasons for recommending them.

Our metropolitan areas in the next decade will expand greatly in population and will be the scene of much of the expected 45 percent growth in our economy. This further concentration of population and industry inevitably carries with it potential for magnified air pollution problems.

The past decade has seen a growing realization of the part of all levels of government and industry of the importance of air pollution. Before 1951, for example, no State had adopted legislation which would authorize a comprehensive study and control program of air pollution problems within its boundaries. I am advised that since that time such programs have been initiated in 13 States. Similarly, much greater attention and expenditure of funds are being devoted to this problem by industry.

The Federal air pollution activity, authorized by the Congress in 1955, has contributed materially to this important change. Research findings under this program have already provided improved tools for assaying local problems and for the control of some specific polluting materials. Other findings from the program, particularly those relating to the health effects of pollutants, indicate a need for further broad studies to determine fully the facts on which necessary controls can be based. For example, I am told that in the past year increas-

ing evidence has accumulated of a causative relationship between air pollution and the prevalence of respiratory chronic disease conditions. The opportunity which such findings provide for further research to determine the full significance to the health of our urban populations is perhaps obvious.

The air pollution legislative amendments, which I have suggested to the Congress, include three elements:

(1) The elimination of the time limitation and the $5 million ceiling on annual appropriations.

(2) Authorization for the Surgeon General to make investigations and hold public hearings on air pollution problems of broad significance; and

(3) A technical amendment to eliminate the requirement for allotment of funds appropriated for grants-in-aid and contracts.

There is in my opinion no question that air pollution is going to be a continuing problem. The Federal Government has an appropriate role to fulfill in this field, and it is important to the national interest that it be authorized to carry on its appropriate functions on a permanent basis. Much of the work included in the Federal program is of a long-term nature, for which appropriate planning is difficult under temporary authorizations.

The continuation of the existing $5 million ceiling on annual appropriations is undesirable from several standpoints. Most important, perhaps, is the difficulty which it entails in making rapid exploitation of any important research findings which may require material expansion of investigative activities. Within the program currently there are several developments which may, in future years, necessitate larger appropriations for their further exploitation. Furthermore, I believe that it is not desirable generally to impose arbitrary budgetary ceilings on research and technical programs, such as are authorized under the Air Pollution Act. Sound administration and appropriate fiscal policies can be practiced better through the annual budget and appropriation process.

The proposed authority for the Surgeon General to conduct investigations and hold public hearings on air pollution problems of broad significance would, in my opinion, provide an important new mechanism for exercising Federal leadership in this field. We have in mind the application of this authority to two general types of problems: those which affect regional areas of interstate character, and those which are of broad significance because they occur in many areas.

As examples of the latter problems, those which occur in many areas, the following may be helpful:

(1) Emission of pollutants from automobile operations is a common phenomenon throughout the country. These are of concern in various areas because of irritative characteristics, their possible adverse effects on health, damage to vegetation, and interference with visibility. It does not appear feasible that this type of problem be approached on an individual community basis. The national character of automobile manufacture and distribution is such that consensus as to desirable actions should be obtained on a broader geographic basis.

(2) Similarly, there are other products distributed nationally on a relatively uniform basis which are of concern in relation to air pollu-

tion, such as additives in gasoline. Perhaps the most widely used of these is tetraethyl lead. With increased gasoline consumption in the future, and perhaps more use of lead per gallon, higher concentrations of lead may be expected in our urban atmosphere. The reduction of such contamination must be considered in relation to other sources of lead to which the population is exposed and to the patterns of gasoline distribution.

(3) Sulfur dioxide pollution, deriving from combustion of common fuels, is one of the most widespread air pollutants. This material is known to cause deterioration of building and other structural materials, damage to vegetation, and has been implicated as the causative agent of serious respiratory disease outside the United States. Although economical methods for control of sulfur dioxide, acceptable to industry, have not yet been developed, their widespread application probably will be necessary in the future.

These are the types of issues, Mr. Chairman, which it seems to me could very profitably be explored at a public hearing called by the Surgeon General.

With respect to the proposed air pollution hearing authority, it is not intended that any recommendations resulting from the investigations and public hearings would be binding on any of the participants. I do feel, however, that such investigations and hearings, if held, would focus public attention on and develop support for the most carefully considered recommendations for solution to the problems which occasioned the hearings. By this procedure the Federal Government would be much better able to exercise effective leadership toward solution of important air pollution problems than is now possible. By the procedure proposed, this leadership could, I think, be exercised in a manner which would be fair and equitable to all concerned.

I would like at this point to underline the philosophy which motivates us to make this kind of recommendation. I know of no better way to sum up that philosophy than to quote from a statement that the Surgeon General made at the National Air Pollution Conference which was held in November 1958. It seems to me that the philosophy underlying this statement is very important for us to keep in mind as we consider the proposal that we made, as we consider the specific matters that are before this committee at the present time.

The Surgeon General said this:

> Before closing, I should like to return to the broader problems of environment and health of which air pollution and its control make up one part. A few minutes ago referring to the circumstantial evidence relating to cancer to atmospheric pollution, I remarked that the case has not yet been proved. This legal metaphor is frequently used. I submit to you—

said the Surgeon General—

> that it is misleading.

I might say parenthetically I concur with him wholeheartedly.

> In law the suspect is innocent until his guilt has been proved beyond reasonable doubt. In the protection of human health such absolute proof often comes late. To wait for it is to invite disaster, or at least to suffer unnecessarily through long periods of time. Many years ago before anyone had seen a germ or positively identified a single causative agent of epidemic diseases, farsighted leaders observed the association between epidemics and filth. Wherever they had sufficient foresight to act on this circumstantial evidence, they made strik-

ing progress. Cleaning up the city filth resulted in better health. Years later they found out why.

I suggest—

the Surgeon General concluded—

that our present position in respect to contemporary health problems, especially those relating to urban environment, may be parallel to that of Pasteur's predecessors.

That is the end of the quotation from the Surgeon General's comments. In other words, it seems to me that the Surgeon General is saying this: Where there is an established risk to the health of our people, we should do everything possible to eliminate that risk, even though in order to do so it may be necessary for us to make an investment and sometimes this investment is represented by additional costs of particular items. But it seems to me that, wherever we have to balance a health risk over against an economic interest, there is no question about what the result should be. The health risk should take precedence over the economic issue.

The other amendment which is proposed is of a technical nature, concerned with the administration of funds appropriated for grants-in-aid and contracts. In the air pollution program, these funds are dispensed on a project basis under the authority of the Surgeon General. Unlike grants-in-aid to States or local agencies for general program support under a formula, the allotment procedure is unnecessary and administratively cumbersome when applied to individual projects as in the air pollution program. We therefore suggest that this provision be deleted from the act.

In summary, Mr. Chairman, I think I can say this, that the amendments we are proposing are amendments that are designed to put the Federal Government in a position where it can exercise more effective leadership in dealing with what is definitely a health risk to our people. I think that the time has come when the Federal Government should do everything it possibly can to provide this kind of effective leadership. That is why we are making these proposals, and I certainly welcome this opportunity to explain them to the members of this subcommittee who have devoted so much time and thought to this very serious problem.

Mr. ROBERTS. Thank you, Mr. Secretary. We are very grateful to you for your statement and your continuing interest in this problem.

I would like to go back to part of your statement at the bottom of page 3, where you point to an example of problems which are of broad significance, and you mention that No. 1, the emission of pollutants from automobile operations. I would like to have you discuss that with reference to work that has been done by the Public Health Service Santitary Engineering Center in Cincinnati. Will you tell us about that, and some of the work that has been going on there?

Secretary FLEMMING. Mr. Chairman, I will be very happy to respond to your question. I might say this. I also have with me today Mr. Vernon MacKenzie, who is the Assistant Chief of the Division of Engineering Services of the Public Health Service, and Dr. Richard Prindle, who is Chief of the air pollution medical program of the Public Health Service. As we move forward with this discussion, undoubtedly you would like to hear from them relative to some of the more technical aspects of this matter.

I know, Mr. Chairman, that you and the other members of this subcommittee have been considering the device that has been developed and which can be installed on cars to eliminate pollution from what is known, as I understand it, as blow-by gases. It is my understanding that these blow-by gases consist principally of unburned gasoline-air mixture leaking past the piston rings into the crank case of an engine. The blow-by gases are diluted in the crankcase with ventilation air drawn in through the oil filter pipe, sometimes known as the breather pipe, and the mixture is discharged normally to the outside through the crankcase vent tube.

Blow-by gases have recently been shown to be a significant portion of hydrocarbon air pollution from automobiles. This, of course, is in addition to the exhaust emissions. This demonstration has been made in tests that have been reported by industry and that have been confirmed by the officials of Los Angeles County, and also by the Public Health Service.

Previous work reported in the technical literature on blow-by gases indicated the pollutional contribution from these to be only a few percent of that deriving from automobile exhausts. In the newer tests, insufficient cars have been evaluated to established firmly the relative contribution of blow-by to the total hydrocarbon pollution from automobile operations, but present data would indicate the blow-by contribution to be in the range of 15 to 40 percent of the total.

The elimination of hydrocarbon pollution from blow-by gases is reported to be relatively inexpensive and easy of accomplishment, especially in new cars. This is done, as I understand it, by piping the blow-by back to the engine intake. The automobile industry, as I understand it, has announced its intention of providing this system for all new cars to be sold in California in 1961, and of making the device available for any other area where it might be determined that it is needed or wanted.

As this committee knows, sporadic cases of eye irritation from hydrocarbon air pollution have been reported from many areas of the country. Plant damage attributable to such pollution has been widely demonstrated in the vicinity of many of our metropolitan areas. Since the majority of cars operate either continuously or intermittently in all of our metropolitan areas, it certain would appear reasonable to me to install this blow-by correction in all cars.

Correction of blow-by pollution cannot, as the committee appreciates, be considered a panacea by any means. The major portion of pollution from automobiles comes out the exhaust pipe. The hydrocarbon composition of blow-by gases is approximately the same as the gasoline used, and thus does not include many of the modified and partially oxidized hydrocarbons and other compounds found in the exhaust gases. Thus elimination of blow-by will not reduce the discharge of a number of exhaust pollutants which may be of health significance.

Practical afterburners for reduction of exhaust pollution are in a relatively advanced stage of engineering development by industry. But certainly in view of the fact that it has been determined that it is possible to eliminate some of this pollution by this device, I can see no reason why it should not be included in all cars. I certainly cannot understand why it would be confined simply to the State of California.

I appreciate the problem that confronts the State of California, and certainly all of us should do everything we possibly can to help in the correction of that problem. But I have understood that people visit California from time to time, and it seems to me that if it were confined to simply cars sold in California, we would not even be making a major contribution, or as much of a contribution as we could make to the State of California. But if it has been established, as I understand it has, that this is a source of air pollution, it is a source of air pollution wherever automobiles are used. If it is possible to reduce this to some extent, I cannot understand why all sections of the country should not have the benefit of that reduction.

In this particular case, I am told that a very small amount of money is involved. But frankly I don't think that should be a consideration. If it has been established that an action can be taken that will reduce this menace of air pollution, I think that action should be taken, and that we should once again decide whatever investment it is necessary for us to make to reduce to some extent a health risk should be made.

Mr. ROBERTS. Thank you, Dr. Flemming, for your appearance here and for your statement.

Gentlemen of the subcommittee, are there any questions?

Mr. SCHENCK. Mr. Chairman.

Mr. ROBERTS. The gentleman from Ohio.

Mr. SCHENCK. I appreciate the Secretray's fine and forthright statement. I certainly concur in many things he has said, particularly that the blow-by device ought to be universally applied, rather than just at certain State limits.

It is my understanding, and I wonder if the Secretary has the same understanding, that ventilating the crankcase in no way affects the total volume of exhaust gases coming out of the tail pipe.

Secretary FLEMMING. That is correct.

Mr. SCHENCK. So that the real significant help which comes from ventilating the crankcase by feeding that blow-by gas through the carburetor, above or below as the case may be, only affects the ventilation in the car itself. Part of the danger of the present ventilating of crankcases is the leakage of that unburned gasoline vapor into the compartment of the cars.

Senator FLEMMING. That is correct.

Mr. SCHENCK. Mr. Secretary, this is of particular interest to me because of the fact that I authored a bill, and, as you know, the House did approve my bill last year to authorize the Surgeon General to conduct a study of the harmful substances contained in exhaust gas and report back to the Congress within 2 years. Do I understand that bill in its form now has the full endorsement of the Department of Health, Education, and Welfare?

Secretary FLEMMING. That is correct, sir. It seems to me that bill is a good bill in that it would put the legislative branch on record as having a very deep-seated concern for this matter, and we would certainly be very, very happy to proceed under the terms of the bill.

I might say this, Mr. Chairman. I think the fact that such a bill is before the Congress is a good illustration of why, in the recommendations we have made, we have asked for the elimination of the authorization ceiling, because sometimes developments take place in this area very quickly. I mean we get a quick breakthrough. If we are in a

position to respond quickly to that breakthrough we can get a much better application of the results of the breakthrough than would otherwise be the case. As you appreciate, if all we need to do is to present our case for additional resources to the Appropriations Committee, rather than come back and ask for a change in the authorization ceiling, it expedites the application of the results of the breakthrough to the situation that may be under study.

I personally feel that in an area like this, particularly in the research area, that authorization ceilings are not too desirable. It seems to me that when the Congress has authorized work in a particular area, then the annual appropriation process does give the Congress the opportunity to participate in the development of the activity in question. But as far as the bill which you authored and which passed in the House of Representatives is concerned, we will do everything we can to indicate our support for the bill in the Senate, and I sincerely hope that the Senate will act on that favorably in this particular session.

In the meantime, Mr. Chairman and Congressman Schenck, within the limits of our resources we will continue to carry forward our research activities in this particular area. But the passage of this bill would help make it possible for us to expedite our work in this area to a considerable degree. I would hope that the Congress would indicate its approval of our activities along this line by passing the bill.

Mr. SCHENCK. Thank you very much, Mr. Secretary.

Mr. ROBERTS. I would like to say, Dr. Flemming, that the subcommittee is greatly indebted to the gentleman from Ohio, Mr. Schenck, for his longtime interest in this field of automotive emissions. We have followed his leadership through the years since the Subcommittee on Traffic Safety was first created. He has done a very fine job and we are very proud of him.

Secretary FLEMMING. Mr. Chairman, might I say that as a resident of the State of Ohio, I am also proud of the leadership that the Congressman has given in this area. I might also say this. I know that when his bill was introduced initially it did make provision for the application of sanctions on the part of the Federal Government in this area. I am sure that Congressman Schenck probably included that reluctantly because all of us are reluctant to see the Federal Government move into a new area in terms of the application of sanctions. But if after the facts relative to a situation are clearly demonstrated, and if after it becomes apparent that it is possible to do something about that situation, action is not taken, then I would reluctantly say that I favor putting the Federal Government in a position where it could apply sanctions, because I see no reason at all why people should continue to be subjected to a health risk when we know how to do something about eliminating that health risk.

Mr. ROBERTS. I could not agree with you more fully. This would be an Ohio day in this subcommittee with two gentlemen from Ohio, and the witness who made such a fine statement, except for the fact that the Keystone State has to come in for its share of the honors today. If I could sing, I would get up at this time and sing a little song.

About 39 years ago more or less there was born up in the Keystone State a young man who was destined to fill a great place in history;

the State of Pennsylvania is not only famous for the birth and life of William Penn and Ben Franklin, but one George Rhodes was born up there this very same day and has contributed, I think, a great deal to the field of public health, and has been quite interested in the work of this committee. Incidentally, George has been here several terms and he has just won another term unopposed for the Democratic nomination. In Alabama that would be tantamount to election, and I am sure it will be in his case, too. George, happy birthday.

Mr. NELSEN. Mr. Chairman, can we throw a birthday party for George with coffee and cakes this afternoon?

Mr. RHODES. Thank you, Mr. Chairman, for your kind remarks. I want to join with you, Mr. Secretray, in paying tribute to our colleague, Mr. Schenck, because of the splendid work he has done in this field. I am sorry that I did not have the opportunity to hear the beginning of Dr. Flemming's statement. I was very much impressed by what he said in closing. I want to say further that Dr. Flemming has always been a good witness and has always contributed much in his appearances before our committee. I appreciate your appearance, Dr. Flemming.

Secretary FLEMMING. Thank you, Mr. Congressman.

Mr. ROBERTS. Mr. Devine.

Mr. DEVINE. Dr. Flemming, as you know, the President yesterday vetoed the water pollution bill on the basis, among other things, that he thinks it is primarily a local responsibility, and suggested that your Department set up a conference in December, or something like that, to go into the problem generally. Do you think it would be illogical to assume that his attitude might be the same with air pollution as it is with water pollution?

Secretary FLEMMING. Congressman Devine, I am sure the basic principle he underlined in his message to the Congress is a principle that he would apply across the board. Of course, the type of leadership that we are asking to be in a position to exercise in this area is the type of leadership and assistance on the part of the Federal Government in which the President firmly believes.

Mr. DEVINE. Of course, we can't anticipate what the President might do on any given legislation, but when you are considering calling a water pollution conference you might also include air pollution in the same general field.

Secretary FLEMMING. Congressman Devine, one of the reasons why I am very enthusiastic about having the opportunity of calling a national water pollution conference is that we got such excellent results from the National Air Pollution Conference that was held under the auspices of the Department and the Public Health Service in November 1958. It seems to me that the results that have flowed from that conference demonstrate very clearly the beneficial effect that can flow from the Federal Government stepping in and exercising that type of leadership. I would have every reason to believe that we could get similar beneficial effects from a national conference in the water pollution area. Of course, as you know, to a certain extent in making these recommendations relative to hearings in the air pollution area I am drawing on the experience that we have had under the Water Pollution Control Act, where there is provision for hearing and provision for the Surgeon General to arrive at findings and recommendations.

In the past year we have had our first experience with those hearings—they are called conferences—in that particular bill. We have signed some notices which have been based on the findings in connection with those conferences, and we have had some good results. When we have spotlighted the issue and spotlighted the things that can be done to improve the situation, there has been a response. Here again I think this is the kind of role the Federal Government should occupy in both of these areas.

Mr. DEVINE. Thank you.

Mr. ROBERTS. The gentleman from New York.

Mr. O'BRIEN. Doctor, I think you made a very clear distinction between leadership on the part of the Federal Government in this field, and the application now of sanctions. As I gather from your statement, you do not believe that our knowledge of this problem and its impact on public health is at this time accurate enough to warrant sanctions in this field. In other words, to warrant authority to the Government to bar from commerce motor vehicles which discharge unburned hydrocarbons in an excessive amount found by the Surgeon General to be detrimental to health. Do you think we are ready yet?

Secretary FLEMMING. Mr. Congressman, our position has been up to the present time that in our judgment we are not quite ready for it. I think that two things have to be considered: One, whether or not, for example, research has reached the point where we could establish definite standards, and then required adherence to those standards. I think it is fair to say that research has not reached that point as yet. Then the second thing is a natural reluctance to extend the authority of the Federal Government into a new area of this kind. I think all of us always hope that by identifying issues, by identifying things that can be done about those issues, that the desire of everyone to minimize health hazards will be such that they will respond to findings of that kind, and that they will take the action that will reduce the health hazard. As I indicated earlier, if there is not going to be that kind of response, then I don't see how the Congress can do anything else but turn to the possibility of sanctions.

Take the specific case that confronts the committee at the present time. Here, of course, we have identified a relationship between these blow-by gases and air pollution. We have also determined that it is feasible to do something about it. Now, if nothing is done about it, or certainly if the problem is not tackled in such a manner as to reduce this health hazard for the people of the country, I don't see how Congress or the executive branch can do anything else but consider the question of what methods can be followed by the Government to see to it that something is done about it. After all, as I see it, the executive and the legislative branch have a common objective. We don't believe in extending the role of government except where it is demonstrated that it is government and government alone that can give the American people the protection against the health risk to which they are entitled.

Mr. O'BRIEN. May I say, Mr. Secretary, that I agree very thoroughly with what you have said. As you know better than I, this is only a facet of a problem which has been thrust before this committee.

Secretary FLEMMING. That is right.

Mr. O'BRIEN. It is a terrible problem, especially for a group of laymen. We are transferring these problems from the scientific to the legislative arena.

Secretary FLEMMING. That is right.

Mr. O'BRIEN. We know of the public concern over cancer and these other things. So there is a temptation to strike out blindly, to strike out through sanctions and other things at anything that might be the cause before we fully know the cause. Sometimes I get alarmed by the whole thing. That is why I am impressed by your suggestion that we have first the Federal leadership. Then when you pinpoint these things and can state they do or probably do cause these things, then apply the sanctions. Otherwise, we might have a situation here that we have a great loss of life from accidents, and we can have a suggestion here that we can save many lives if we prohibit the sale of motor vehicles which will travel more than 40 miles an hour. Where we stop no one knows. I like your reasoned approach to the whole problem.

Secretary FLEMMING. Thank you, Mr. Congressman. I do believe that Government should proceed in this particular matter. I feel that the Government should also indicate a willingness to take the additional step if it becomes necessary. I would certainly hope that it would not be necessary. When we pinpoint a cause, when we pinpoint a method for eliminating the cause, then we should get the kind of action that would give our people the protection against the health risk to which they are entitled.

Mr. O'BRIEN. If sanctions were left standing in the wings, it would bring about perhaps a better cooperation in these studies on the part of the industries affected.

Secretary FLEMMING. That is right. I certainly think that all of us should indicate very definitely that we recognize that the sanctions are standing in the wings. We hope they don't have to be brought out, but we would not hesitate to bring them out if we felt that this was the only way of protecting people against unnecessary health risk.

Mr. O'BRIEN. But to repeat, we are not yet ready for the sanctions in this field.

Secretary FLEMMING. That has been our judgment on the matter.

Mr. O'BRIEN. Thank you, Mr. Secretary and Mr. Chairman.

Mr. ROBERTS. The gentleman from Minnesota.

Mr. NELSEN. Mr. Chairman, I have no questions, but I would like to make an observation. I think it would be a mistake if we were to attempt to leave the impression that a $2 gadget on an automobile motor would solve the problem. Those of us who have operated tractors and machines understand that a leaky piston, a wornout piston ring, will create crankcase pressure that not only creates blowby, but also creates the burning of oil that comes out of your exhaust pipes.

My point is this, that we must not mistakenly assume that this little gadget will cure the whole problem. It will help.

May I again reemphasize that in my own case, I drive a Henry J. Kaiser which has this little gadget on it, and we are very healthy out on our farm, and maybe that is the reason for it.

Secretary FLEMMING. Mr. Chairman, I would like to say to Congressman Nelsen that I agree completely with his observation. As I

indicated in commenting on the blow by gas pollution, it is our feeling and the feeling of our scientists who are devoting so much time to this, that this should not be considered as a panacea, by any means.

Our only point is, and our only feeling is, that it represents a contribution in the right direction. In view of the fact that it has been established that it can make a contribution in the direction of lessening this particular hazard the contribution ought to be made. For the life of me, I can see no reason at all why it should not be made and to this extent, even though it may be a modest extent, we should not reduce this particular risk. As I see it, this is the only way in which we are really going to make progress in this area. As we get hold of a situation where we have identified a cause, where we have identified a method for dealing with the cause, at least to some degree, that we go ahead and do something about it. If we do this in a number of instances over a period of time, ultimately we are going to have a much healthier situation.

Mr. ROBERTS. Thank you, Mr. Secretary. In connection with the gentleman from Minnesota's statement, all along we have recognized the fact that this is an urban problem and if one was fortunate enough to live in Hutchins, Minn., one would not be worried too much about the business of air pollution.

The gentleman from Florida.

Mr. ROGERS of Florida. Thank you, Mr. Chairman.

I am sorry to be late, Mr. Secretary. I have read your statement and I think it is a very excellent one. I notice in your statement you feel that this problem is nationwide, and wherever there are automobiles and certainly when they are together in any great number this will be a problem, and will probably grow as our metropolitan areas grow.

Secretary FLEMMING. That is correct.

Mr. ROGERS of Florida. What present authority do you have to investigate and hold hearings to point up these problems?

Secretary FLEMMING. At the present time we do not have any formal authority given to us by the Congress to hold the type of hearing that I am suggesting be included in the law. Of course, we do have the authority to carry on research in this particular area under the 1955 act. As you know, we have been, and we are continuing to carry on research under the provisions of the act. As far as that aspect of our authority is concerned we are simply suggesting that the time factor be eliminated, that is, the time limitation, and also the authorization ceiling, so as to give us more flexibility in carrying forward those activities.

On the formal hearing side, we feel it would help a great deal to demonstrate to the country as a whole that the legislative and executive branches are united in dealing with this problem if the Congress authorized us to conduct formal hearings and then at the conclusion of those hearings to file with the public our conclusions and also our recommendations as to what can be done about the conclusions.

Mr. ROGERS of Florida. I just wondered if you had any authority where you felt that the situation was detrimental to the public health. For instance, in Los Angeles, under present authority could you go there and make an investigation and make public your findings, or would you have to be requested to do so by the State authorities?

Secretary FLEMMING. At the present time the authority is such that we would have to receive a request to go in and take a look at the specific problem. We are talking now about a local situation. This is one of the reasons why, in these proposed amendments, I suggested that we be given authority to hold a hearing on matters that are of common concern to the country as a whole, or on matters that might affect two or more States. These might be regional matters. The proposal we have submitted to Congress would give us the authority to go in on our own initiative or at the request of a State that is being affected by the matter. I think that if the Congress should include this in the law, certainly our normal practice would be to only go in on request. But I do think that it is a good thing to leave us in a position where in a very extraordinary situation we would have the right to go in and conduct a hearing on our own initiative, although we would be very reluctant to do that.

Mr. ROGERS of Florida. As to something of a more personal nature, I wonder if you are doing any research and having any results on the common cold at NIH?

Secretary FLEMMING. Obviously the research that has been carried on in that area has not yet produced results.

Mr. ROGERS of Florida. I am aware of that.

Secretary FLEMMING. That is, results that can be of help to most of us who at one time or another become consumers in that particular area.

Mr. ROGERS of Florida. I hope you will push that research.

Secretary FLEMMING. Thank you, sir. I have the same feeling.

Mr. ROBERTS. The gentleman from Nebraska.

Mr. BROCK. Yes, Mr. Chairman, merely to say amen to the statement that the Secretary brought to the attention of the committee this morning. It is not the habit of the Secretary to go around McGillicudy's barn in bringing his statements before the committees of Congress, and we appreciate the forthright statement that you bring to us. Thank you, Mr. Secretary.

Secretary FLEMMING. Thank you very much, Congressman Brock.

Mr. ROBERTS. Mr. Secretary, I was just looking at the summary report which you sent up along with your formal statement. I have been reviewing it, and I think it might be well if you would like to include that attachment with your formal statement.

Secretary FLEMMING. I would be very happy to do that.

Mr. ROBERTS. Without objection, "Summary Report on Research and Technical Assistance under the Provisions of Public Law 159, 84th Congress, as Amended," will be included through page 7.

(The report referred to follows:)

SUMMARY REPORT ON RESEARCH AND TECHNICAL ASSISTANCE UNDER THE PROVISIONS OF PUBLIC LAW 159, 84TH CONGRESS, AS AMENDED

A progress report on air pollution research and technical assistance activities was submitted to the Subcommittee on Health and Safety of the House Committee on Interstate and Foreign Commerce May 19, 1959, in connection with the hearings on extension of the Air Pollution Research and Technical Assistance Act. This report, together with supplementary list of air pollution projects, appears in the printed record of hearings before a subcommittee of the Committee on Interstate and Foreign Commerce, House of Representatives, 86th Congress, 1st session, on H.R. 2347, H.R. 3183, H.R. 3730, H.R. 4466, H.R. 7476, S. 441—"Air Pollution Control"—May 19 and June 24, 1959.

Most of the projects described in the above-noted report are of long-range character. Consequently, much of the work is still underway at the present time. The following statement, with attached lists of projects now under study, summarizes additional progress on air pollution studies since May 1959.

STATEMENT OF PROGRESS SINCE MAY 1959

Automotive emissions

The automative exhaust laboratory at the Public Health Service's Sanitary Engineering Center in Cincinnati has been completed and is currently being used in studies principally directed toward obtaining information on exhaust composition and the biological effects of such emissions. A scientific team including physicians, veterinarians, an ophthalmologist, a toxicologist, automotive and mechanical engineers, chemists, biologists, and related scientific staff, is working on a coordinated approach to the problem.

The Public Health Service established in July 1959 a Technical Task Group on Automotive Exhaust Research, to provide improved technical liaison between all parties concerned with research on automotive exhaust of air pollution.

In response to the recommendation of an ad hoc Committee on Tetraethyl Lead, appointed by the Surgeon General, the Public Health Service has initiated research specifically to evaluate the extent of lead contamination in the atmosphere and the exposure of community population groups resulting from the use of tetraethyl lead in motor fuels.

Air pollution standards

Technical data and assistance were provided to the State of California in connection with the development of statewide standards for ambient air quality and for motor vehicle exhaust. These standards, promulgated in December 1959, represent the first examples of such air quality requirements in this country.

Survey of 3-4-benz-pyrene content of the air

In the past year, initial application has been made of the newly developed analytic procedure for determining the amount of 3-4-benz-pyrene, a known carcinogen, in air. Preliminary surveys of the air in approximately 140 cities in the United States have shown variable but significant quantities of this substance. These surveys are being correlated with investigations of the carcinogenic potential to laboratory animals from the particulate matter collected from the air of nine American cities, and lung cancer mortality data for the same cities.

National air sampling network

The network, which heretofore had been sampling for particulate pollution only, has commenced, on a trial basis, to collect and analyze samples for gaseous pollutants. Also, cooperatively with the Weather Bureau, a network of approximately 30 precipitation collection stations has been established to investigate the role of natural precipitation in the removal of pollutants from the atmosphere. These additions to the network are intended to develop means for providing a more complete picture of the quality of the Nation's air. Analysis of network data shows pollution to be primarily urban, the nonurban contribution in most cases being negligible. In addition, during the recent steel strike, a special sampling project for collecting airborne particulate matter was carried on in several cities in which steel production activities are important.

Meteorological aspects of air pollution

A project for testing the ability to predict, from standard Weather Bureau data, the occurrence of high urban air pollution levels, previously limited to a quadrangle involving only a few eastern States, was expanded and successfully operated in all States east of the Rocky Mountains. A field trial was initiated on the potential use of radar to measure the height of the inversion ceilings which limit vertical dispersion of air pollutants in the atmosphere. In another study, visibility in several California cites was shown to be decreasng over the last few decades.

Instrumentation research and development

An ozone measuring instrument originally developed in England for upper-air use was modified for measuring ground-level concentrations and is now in commercial production. Also in commercial production are a membrane tape sam-

pler, a constant flow regulator for the high-volume air sampler widely used in this country, and a field test kit for analysis of a large number of air pollutants.

Chemical research and development

A large number of qualitative and instrumental investigations were directed at the problem of identification of atmospheric pollutants. New methods were published for the measurement in air of phenols, pollen flavonoids, organic acids and aldehydes, the larger polynuclear aromatic hydrocarbons, and a variety of other chemical pollutants. Of particular interest are the quinones, which represent an early stage in the modification of potentially carcinogenic material by the atmosphere.

The smog in Washington, D.C., during the June 8–11, 1959, was analyzed and found to resemble Los Angeles smog in many of its chemical characteristics. Mild eye irritation also was reported.

Field studies

A manual on assay and control of atomospheric effluents from petroleum refineries has been prepared and a wide distribution is planned as a guide to desirable control practice. Reports were prepared on previous field studies of cotton ginning and alfalfa dehydration effluents. A cooperative Federal-State-local study of the emissions of nitrogen oxides from stationary sources in the Los Angeles area was initiated. Nitrogen oxides play a significant role in the photochemical oxidant type of smog.

Epidemiologic and demographic studies

Numerous technical references have been made to the possible association between the temporal frequency of human deaths from external and normal causes, and various atmospheric variables. In an attempt to determine whether atmospheric pollution levels can be correlated positively to deaths from suicides and homicides, an exploratory study of available data was undertaken. A significant relationship has been noted between maximal changes in barometric pressure and daily deaths. Investigations will continue into the possible contributions of barometric pressure changes (as affecting air pollution levels) to this effect.

Studies of the relationships of air pollutant measurements with morbidity and mortality statistics have been dependent on the development of complex statistical methodology and data handling procedures. The availability of electronic data computer techniques has removed the latter obstacle (i.e., handling large quantities of data) ; a recently activiated investigation may provide information on these relationships.

A clinical-epidemiologic study of two communities, situated in a valley with remarkably constant prevailing winds, has been initiated. These communities have nearly equal population size, are only 4 miles apart, and are qute similar demographically. Located between these communities is an industrial source of air pollution which exposes severely one community while almost completely sparing the other. By means of elaborate plumonary function testing, individual health evaluation, and chest X-rays, the prevalence of lung disease will be compared between the two communities, particularly with respect to the chronic bronchitis-emphysema-asthma type of lung diseases.

A retrospective study of hospital emergency care, during "New Orleans asthma" episodes, has provided evidence of a relationship between the incidence of asthma emergency treatments and wind movements from geographic areas containing pollutant sources. There is further evidence which indicates that a number of etiologic agents are involved.

Laboratory studies

Besides the importance of determining the direct toxic and other physiologic effects of various atmospheric pollutants, the possibility of these pollutants increasing the susceptibility of animals and man to infectious pulmonary diseases must be considered. A study has been initiated recently to determine the effects of exposure to atmospheric pollutants on the susceptibility of animals to certain infectious respiratory diseases.

The study of the relationships of air pollution to histologic changes in the epithelium of the tracheo-bronchial tree should provide information for the evaluation of any relationships between air pollution and the incidence or progression of lung cancer. Toward this end, an investigation of geographic and other distributions of cases of abnormality of the tracheo-bronchial epithelium in human beings has been initiated.

To demonstrate the effects on naturally occurring air pollution on a normal animal population, a group of chickens have been exposed for a period of about 1 year, with observations on the effects of pollution upon a sensitive physiologic process—egg fertility and hatchability. No deleterious effects have been noted to date. This study will continue for the lifetime of the animals.

Development and evaluation of suitable methods for measuring transbronchial resistance, an index of breathing difficulties and lung function have been completed. This makes possible the undertaking of epidemiological field studies of a clinical nature which could not previously have been conducted meaningfully.

Mr. ROBERTS. Again I express appreciation of the subcommittee for your time and your appearance here this morning.

Secretary FLEMMING. Mr. Chairman, I appreciate very, very much the opportunity of being here and again I want to say to the members of this committee how heartening it is to those of us in the executive branch who are working in this area to have a subcommittee of this caliber give so much time and thought to this problem. I think the fact that all members of the subcommittee are here while these hearings are proceeding speaks very highly in terms of the dedication of the members of the subcommittee to working out a solution that will help to eliminate these risks. I can assure you that we stand ready to cooperate with the subcommittee in any way that we possibly can, and I hope that if at any time you have suggestions as to things that we can do that we are not doing to move toward this common objective, that you will certainly pass them on to us. We will be very glad to respond to them.

Mr. ROBERTS. Thank you, Mr. Secretary.

Secretary FLEMMING. Thank you.

Mr. ROBERTS. Our next witness will be Mr. Vernon G. MacKenzie, sanitary engineer, Bureau of State Services, U.S. Public Health Service, Department of Health, Education, and Welfare, Washington, D.C.

STATEMENT OF VERNON G. MacKENZIE, SANITARY ENGINEER, BUREAU OF STATE SERVICES, U.S. PUBLIC HEALTH SERVICE, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Mr. MACKENZIE. Mr. Chairman and members of the committee, I have with me this morning Dr. Richard Prindle, chief of the air pollution medical program of the Public Health Service. We appreciate the opportunity of meeting with you on the problem of air pollution.

At the hearings of this subcommittee last May, the Public Health Service submitted a progress report on its air pollution program activities, covering the period from 1955 through May 1959. The statement which has been submitted summarizes additional progress on our air pollution studies since May 1959, and I would like, with the committee's permission, to also mention some of the more important developments in this field, which have occurred in the past year.

With respect to automotive emissions as an air pollution problem, there has been a considerable increase in the effort overall devoted to this particular subject. This is particularly true of the activities by the Public Health Service and the automotive industry. There is a much better liaison and a coordination between the various parties engaging in research in this general field. During the past year the Public Health Service has established a technical task group with rep-

resentation from the various organizations which are active in research relating to automobile missions.

One of the things that is of importance in this field is the great improvement of instrumentation which has occurred for measurement of pollutants coming from automobiles. Part of this has derived from industry sources and part of it from the support of research projects, either carried on directly by the Public Health Service or supported by it elsewhere. Also, an item which is deserving of remark is the greatly improved laboratory facilities which have been made available for studies in this general area by the Public Health Service, by Los Angeles County, and by the University of California at Riverside.

Several new developments in this general area are notable in the past year. One which has received considerable discussion already in this committee hearing relates to the studies on blowby. A second is related to the progress which has been made on the development of exhaust control devices. Whereas a year ago the scientific possibilities of developing such devices were fairly well established, there remained a great deal of work to be done on their engineering development and design for installation on actual automobiles. I can say that in our opinion we are considerably further along the road in this regard than we were a year ago.

Another item I would like to call to the attention of the committee is a problem with which we are becoming concerned in relation to automobile emissions, and this is emission of lead from the use of tetraethyl lead in gasoline. During the last year the industry has proposed an increase in the use of tetraethyl lead from the maximum level of 3 milliliters per gallons of gasoline to a maximum of 4. In considering this development, the Public Health Service gathered together an expert committee to determine whether in its opinion this would create immediate problems in air pollution such that we should oppose this proposed increase in use of lead by the industry.

The committee reported that in its opinion this action should be allowed to proceed, but that the situation should be watched carefully. We are initiating studies on the levels of lead occurring in urban atmospheres in various parts of the United States for this purpose, as well as evluating the levels of body burden of lead in selected groups of our population, particularly in urban areas.

To go on to another specific area in the air pollution field, I might report to you that the Public Health Service currently is expanding its activities in the national air sampling network to include on a trial basis sampling for pollutant gases as well as for particulate materials. During the steel strike we have been carrying on some sampling in particular cities in which steel production activities are an important part of the economic picture.

One broad area of research which is of increasing importance as revealed by our research findings is concerned with the reactions which occur in air between pollutants after these have been discharged. In many instances the effects of air pollution are not caused by the primary pollutants which are discharged from various sources, but comes from transitory reaction products that occur from the reactions in the air between these pollutants, while they remain suspended.

We find in this connection that these reactions synergize or increase the effects of some pollutants and in other cases change the pollutants that have previously been discharged.

Congressman Saund this morning made reference to the agricultural damage that occurs in Riverside County in California. This is not an isolated phenomenon, but one which is occurring very broadly in many areas in the United States. One of the most widespread causes of agricultural damage from air pollutants is associated with fluoride pollution which comes from the manufacture of a number of metals as well as from the chemical industry in the manufacture of fertilizer. We have completed in cooperation with the Department of Agriculture a book on fluoride air pollution and its effects. This is now in process of publication and will bring together in a comprehensive form the information on this important problem which heretofore has been scattered through the technical literature.

One other advance in the agricultural field which I think is deserving of mention is the identification of ozone as the specific responsible agent for production of weather fleck damage on tobacco which causes millions of dollars of damage each year.

In the area of air pollution standards significant progress has been made in the past year, particularly in the State of California. By direction of the State legislature, the State health department in California has developed the first statewide objective standards relating to the quality of ambient air and requirements for emissions from automobiles. The Public Health Service has cooperated extensively with the State of California in this significant effort during the past year.

In the field of measurement methodology, which is important from the standpoint of assay of our pollution problems broadly across the country, progress has continued in the past year, and several pollutant measuring devices developed by the Public Health Service are now in commercial production. These relate to means for measuring automatically ozone in air; a new type of membrane filter tape sampler for measuring particulates, and making easier their chemical analysis, and identification; and a field kit which can be used for preliminary assay by individual communities of their own air pollution problems. New methods have been published on analysis of phenols in the air, organic acids, aldehydes, polynuclear hydrocarbons, and some of their breakdown products, particularly the quinones.

In meteorological studies we have advanced to the point where trial forecasting is now underway for the area east of the Rocky Mountains, by which we attempt to forecast periods in which pollution may be higher than normal in any particular area of that part of the country.

In our health studies we have completed a community study in the city of Nashville, and the results are now under analysis and should be ready for reporting by the end of this fiscal year. To be completed soon, there is a two community study now underway in the State of Pennsylvania, relating to the exposure of community population to sulfur dioxide pollution. Initial analysis has been made of lung cancer statistics in various parts of the country as part of our continuing studies.

The auto exhaust research facility at Cincinnati, I am happy to report, is completed, and is now actively engaging in test procedures. This facility is probably the most complete and extensive of its kind which is now extant in the United States. There now are, in addition to our facilities at Cincinnati, the laboratories which I have mentioned in Los Angeles County and at the University of California, in Riverside. These three locations are the ones in which the most extensive research of this kind is now possible.

The facility at Cincinnati is unique in that it provides, along with other purposes, for the exposure of animals to irradiated exhaust mixtures, and also for assay of eye irritation potential which may develop under various dilutions of exhaust with air and their irradiation under artificial sunlight.

This, Mr. Chairman, summarizes briefly the progress which the Public Health Service has made, and brings to your attention some of the more active projects on which we are now engaging.

If there are questions, Dr. Prindle and I would be glad to provide such information as we are able for you.

Mr. ROBERTS. Thank you, Mr. MacKenzie. Before we go into the question period, the committee will be in recess for a short time.

(Brief recess.)

Mr. ROBERTS. The subcommittee will please be in order.

I would like for you to tell us something of the work of the Sanitary Engineering Center in Cincinnati, particularly with reference to the work on automotive exhausts.

Mr. MACKENZIE. I would be glad to, sir. I might start by giving a brief description of the auto exhaust research facility which has recently been put in operation out there. This starts with an automobile which is mounted on a chassis dynamometer. This is a device whereby the automobile can be loaded to simulate what happens as it goes along the road. The automobile can be automatically controlled on any predetermined driving cycle, that is, so long a time for the engine to idle, so long a time to accelerate up to a given speed, so long for cruising at a predetermined speed, and so long for deceleration, and so on. The exhaust gas coming from this automobile is mixed with purified air in various ratios which can be controlled. The exhaust air mixture is then measured and passed to irradiation chambers where the mixture is exposed to artificial sunlight. These chambers are two in number, and provide a residence time for the air-exhaust mixture varying from 24 minutes up to a maximum of 4 hours.

Within these chambers the mixture can be exposed to anything up to 100 percent of the equivalent of maximum sunlight intensity. The exhaust mixture after irradiation is then analyzed both by automatic instrumentation and by grab sample and wet chemistry methods. The instrumentation for automatic measurement of the components in the mixture is as complete as we can provide and includes mass spectrometry and infrared and ultraviolet spectrometry, and new chromatographic procedures for separating the components and measuring them individually. Overall the facility provides for taking into account various automobile operating variables, such as engine type and condition by putting various automobiles on the dynamometer.

The driving cycle can be varied. Fuel composition can be studied. The effects of various fuel and oil additives can be studied. The atmospheric variables that are under control include the irradiation in the chambers, both intensity and time, the amount of diluting air that is mixed, and the chamber temperature and humidity. The effects of all these can be studied with respect to the chemical composition of the materials that are discharged. We have provisions for exposing various types of plants to determine vegetation damage that may occur. We can expose people to the irradiated mixtures for determining the extent of eye irritation which develops. The degree of visibility reduction that is produced by the irradiation of the exhaust mixture can be determined. We are also exposing animals and measuring the effect upon them of short-term exposures to this irradiated gas mixture.

This is the principal activity that is going on at the sanitary engineering center in relation to the study of automobile emissions. We have, however, for some time also been devoting considerable attention to the development of methods of studying this problem, and in particular the procedures to be used for measuring the pollutants. This type of fundamental tool has had to be developed before many of the studies that we are now undertaking could have been started.

In addition to what we are doing at the sanitary engineering center in this field, we are supporting research by other agencies, by the Bureau of Mines and by the Bureau of Standards, in relation to analytic developments, and by the Bureau of Mines in relation to assay of possible catalysts that may be useful in oxidizing exhaust products. We are supporting research in non-Federal installations at universities and elsewhere devoted to the study of health effects of specific components of automobile exhaust gases and studies on chemical reactions among these products, both at the University of California in Riverside and elsewhere.

Mr. SCHENCK. Mr. Chairman, before Mr. MacKenzie goes further, I wonder if you won't clear up for the benefit of the committee what you mean by a loaded dynamometer. Is that a dynamometer upon which the wheels of the automobile turn so that any load factor can be added or adjusted, and therefore simulate the driving conditions?

Mr. MACKENZIE. You have described it exactly, sir. The rear wheels of the automobile are mounted on rollers on the dynamometer. The resistance offered by these rollers can be varied and so load the automobile in a way which simulates a driving condition.

Mr. ROBERTS. How much experience have you had in this field of air pollution?

Mr. MACKENZIE. I have been in the Public Health Service for over 20 years. I have been active in relation to the air-pollution problem since I first became interested in it early in the 1950's while I was director of the Sanitary Engineering Center at Cincinnati.

Mr. ROBERTS. How do you determine the concentration of irritants that the human body can absorb without danger to the lungs?

Mr. MACKENZIE. I would like to refer this question to Dr. Prindle.

Mr. ROBERTS. Surely.

Dr. PRINDLE. This is an extremely difficult question to answer from the standpoint strictly of irritation. Our attempts have employed many techniques because there is no clearcut way to make this deter-

mination. The simplest, perhaps, and the one we have been using particularly in Cincinnati at the Occupational Health Field Headquarters, has been to determine the effects on animals, using them as analogous to a certain extent to humans, of simple air pollutants—single gases, one at a time, either through acute exposures or long-term exposures.

Mr. ROBERTS. Would you tell us some of the experiments with animals?

Dr. PRINDLE. We have for some time been experimenting with ozone itself. We have used this compound as one we have known was present in certain air-pollution areas, and one which could be considered somewhat of a prototype of all of those that we have labeled oxidants because it does have an oxidizing reaction. Animals of various kinds have been exposed, both for acute periods of time, to see at what level immediate death occurs, and to long periods of time, some as much as 6 months or 2 years. Here we have used low levels of ozone day in and day out, the animals being exposed and sacrificed at intervals for pathological examination to determine what effect has occurred.

For example, in this particular group of studies we have determined that exposure to very low levels of ozone can result in scarring of the lung tissues and changes of a bronchitis type. At the same time we have shown that animals who were peculiarly susceptible to cancer as a hereditary factor are made more susceptible, and have a higher incidence of cancer when exposed to ozone.

In other type of experimentation that we have done, we have attempted to determine what changes have occurred in function, rather than awaiting the ultimate death and pathological examination as to what has happened. We have attempted to measure what is going on while it is going on. We have assumed, partly through experience and partly through knowledge from other sources, that changes in respiratory function, or what might be called breathing ability, would be another way of measuring this irritation.

A large part of our program, therefore, particularly in the last 3 years, has been devoted to developing devices and methods for measuring this pulmonary function. Such function can be this: How big a breath can one take? What resistance does one feel to exhaling or inhaling air as a function literally of the "pipe system" into the lungs? What maximum oxygen intake would one have under certain circumstances? We have developed methods, therefore, for measuring this on both animals and on human beings.

In general, with human beings this has been extremely difficult heretofore. It has required hospitalization, very fancy equipment, which cannot be used for assaying the problems of a community. We have been attempting to develop simple devices that could be utilized by nurses and physicians in the field to ascertain the condition of people living in air pollution situations.

Mr. ROBERTS. Doctor, let me interrupt you just a minute. Have you performed experiments involving amounts of sulfur dioxide?

Dr. PRINDLE. Yes, sir.

Mr. ROBERTS. And what about tetraethyl lead?

Dr. PRINDLE. We are just beginning work on this at this time, as far as the air pollution program is concerned.

Mr. ROBERTS. Would you tell us about some of the elements that are present in smog?

Dr. PRINDLE. Ozone I have already described. We have used it as typical of some of the oxidant compounds. We have specifically tested a few of the other oxidant types of compounds. These are generally hydrocarbons which have available oxygen atoms which seem to have an irritating action on human or other membranes.

Mr. ROBERTS. Would you go so far as to say that animals in those experiments—I believe you said something about causing lung scar tissue—would you say that the exposure of animals in these experiments to ozone could cause lung cancer in these animals?

Dr. PRINDLE. This I would be loath to say at the moment with our present experimentation. We have demonstrated that those animals who are susceptible to cancers seem to have them at a higher incidence when exposed to ozone. Whether this is a factor that seems to promote or actually causes cancer is perhaps moot as far as the individual exposed is concerned, but scientifically it makes some difference.

Mr. ROBERTS. As a physician, what in your opinion would be the effect of people who are already predisposed to some type of lung infection, such as an elderly person who might have some type of lung infection. What would be the effect on a person of that type to exposure from smog?

Dr. PRINDLE. For individuals who already have preexisting conditions similar in nature to those you have described, I think there is incontrovertible evidence that they are easily affected by certain air pollution.

Mr. ROBERTS. What do you mean by easily affected? Do you mean that their condition is worsened?

Dr. PRINDLE. Their condition is worsened.

Mr. ROBERTS. Does it cause cancer?

Dr. PRINDLE. Cancer? Again I would be hesitant here. That their condition is worsened can be exemplified very well by the deaths which occurred in Donora and London in which people were affected fatally by these exposures.

Mr. ROBERTS. What did the people in Donora and London die of?

Dr. PRINDLE. This is a rather difficult thing to express because they seemed to die of the conditions which they already had. In other words, if they had bronchitis or emphysema, these conditions worsened and they died of those situations.

Mr. ROBERTS. You are saying that they are going to die anyway. What I am trying to find out is if ozone concentration causes death.

Dr. PRINDLE. It caused death; yes. It caused death prematurely.

Mr. ROBERTS. Did you follow the experiment that was carried on in New Zealand with reference to polluted air that was brought forth in the symposium held in San Francisco in January of this year?

Dr. PRINDLE. Yes, sir.

Mr. ROBERTS. What would be your comment on Dr. Eastcott's findings?

Dr. PRINDLE. Independently, at that same conference, I reported on our findings which were of a very similar nature, to wit: We found that there might be a very significant contribution to the lung cancer picture in urban areas as the result of exposure to air pollution.

Mr. ROBERTS. That study that he made was carried on in two 5-year periods?

Dr. PRINDLE. Yes, sir.

Mr. ROBERTS. He said that the conclusion is inescapable that lung cancer is a product of total environment and polluted air plays part, smoking and other irritations are factors. That was in reference to two particular groups. One group, as I understand it, had moved into New Zealand, and they compared them with another group that had been in New Zealand prior to the coming of the new population. I believe there was a quarter of a million persons who had moved from the smoggy industrial part of England into the unpolluted atmosphere of New Zealand.

Dr. PRINDLE. That is correct.

Mr. ROBERTS. They found that lung cancer was 30 percent higher among the new population than those who had lived in the unpolluted area all the time.

Dr. PRINDLE. That is right. May I add that he took into account smoking, occupational hazards, and the only factor unaccounted for was this exposure which the people had had previously in England. He further divided the group into those who lived in England 30 years or more before coming to New Zealand, and those who lived there 30 years or less. There were marked differences: the longer the exposure the higher the incidence of the disease.

Mr. SCHENCK. Will the Chairman yield?

Mr. ROBERTS. Yes, sir.

Mr. SCHENCK. I wonder if Dr. Prindle for the record will define the term "ozone" and what you mean by that in a way that the record may be clear?

Dr. PRINDLE. Yes, sir. Ozone is a molecule which consists of atoms of oxygen. Ordinarily oxygen exists in the air as a molecule consisting of two atoms of oxygen. Ozone is three atoms of oxygen, and as a consequence of this unusual structure, it is more reactive. It will apparently react more quickly and perhaps therefore be more irritant and active to tissues.

Mr. SCHENCK. So it is an oxidizing agent?

Dr. PRINDLE. Yes, sir.

Mr. SCHENCK. At the present time, as I recall, very roughly, the normal air we breathe is about 20 percent oxygen and 80 percent of various nitrogen compounds.

Dr. PRINDLE. That is right, sir.

Mr. ROBERTS. The gentleman from New York.

Mr. O'BRIEN. I have just one question. Has there ever been a study of the incidence of cancer among smokers and nonsmokers residing in an area where the air is not polluted? In other words, rural areas?

Dr. Prindle, I know of no specific study carried out on this especially except one in South Africa reported rather recently.

People outside of the major cities were observed to have a lower incidence of cancer. Let me go back and say those who did not smoke at all had the lowest incidence. Those who smoked, considerably more. But neither of these groups had as much as those who smoked and lived in the large communities.

Mr. O'BRIEN. Thank you. That is all, Mr. Chairman.

Mr. ROGERS of Florida. I have just a few questions, Mr. Chairman. You are discussing your program for research on air pollution. What is the budget that is devoted to this field.

Mr. MacKenzie. We have a budget during the current fiscal year of approximately $4,300,000. We can provide the exact amount for the record if you desire. The proposed budget for 1961 amounts to $4,900,000.

Mr. Rogers of Florida. How many are on the staff working on this problem, approximately?

Mr. MacKenzie. I can only approximate that, sir.

Mr. Rogers of Florida. I realize that.

Mr. MacKenzie. About 60 percent of our funds are currently used for internal activities and the remaining 40 percent are used for support of grants and contracts with other organizations.

Mr. Rogers of Florida. How many in the Public Health Service?

Mr. MacKenzie. Of the money we would have about $2,700,000 for internal activities. This might correspond to a staff of approximately 250 people. I could give you more exact figures if you would like them.

Mr. Rogers of Florida. I think it would be helpful just to give us a picture of what is being done.

Mr. MacKenzie. Surely.

(The information referred to follows:)

Summary of air pollution funds, fiscal year 1960 and requested fiscal year 1961

	1960 estimate	1961 estimate
A. BY ACTIVITY		
1. Research:		
Auto exhaust	$827,900	$1,233,600
Engineering research	302,900	304,700
Chemical research and development	304,800	438,600
Instrumentation	116,300	117,000
National air sampling network	212,900	270,500
Meteorological and agricultural research	337,700	339,800
Clinical and toxicological research	449,300	452,400
Community epidemiologic and aerometric studies	616,500	620,500
Research grants	450,000	450,000
Total research	3,618,300	4,227,100
2. Technical assistance:		
Operations	382,800	385,300
Demonstration grants	40,500	40,500
Total technical assistance	423,300	425,800
3. Training:		
Operations	171,600	172,700
Grants	100,000	100,000
Total training	271,600	272,700
1 less day's pay in 1961		−4,600
Total, air pollution program	4,313,200	4,921,000
B. BY METHOD OF FINANCING		
1. Direct operations	2,690,200	3,227,300
2. Research contracts:		
(*a*) Contracts with other Federal agencies	608,000	634,500
(*b*) Non-Federal research contracts	424,500	468,700
Total contracts	1,032,500	1,103,200
3. Grants:		
(*a*) Research grants	450,000	450,000
(*b*) Training grants	100,000	100,000
(*c*) Grants for special demonstration projects	40,500	40,500
Total grants	590,500	590,500
Total air pollution program	4,313,200	4,921,000

Air pollution program, full-time personnel on duty as of Feb. 27, 1960

A. Professional and scientific personnel:	
Program	93
Administrative	16
Total	109
B. Subprofessional personnel (program)	39
C. Clerical and research-supporting personnel:	
Program	63
Administrative	12
Total	75
D. Total personnel:	
Program	195
Administrative	28
Grand total	223

Mr. ROGERS of Florida. How many research projects, approximately, would you say are being carried on under this program which have been authorized by your Department?

Mr. MACKENZIE. Including our internal research project and those that we are supporting by grants and contracts, I expect that we have 150 or more, sir. These are tabulated, by the way, in the supplement to the progress report which has been provided to you.

Mr. ROGERS of Florida. What facilities do you use other than the laboratory you spoke of at Cincinnati?

Mr. MACKENZIE. We have two facilities in the Public Health Service. Both of them are at Cincinnati. The first is the Sanitary Engineering Center, which is the location of the auto exhaust research facility which I described. There is also another research laboratory of the Public Health Service in Cincinnati, the Occupational Health Field Headquarters, and a considerable portion of our activity in toxicology research is carried on at that location.

Mr. ROGERS of Florida. Was there any particular reason why Cincinnati was selected to center your activities?

Mr. MACKENZIE. The availability of the laboratory facilities, sir.

Mr. ROGERS of Florida. You didn't construct those facilities?

Mr. MACKENZIE. These have not been constructed since the passage of the air pollution legislation.

Mr. ROGERS of Florida. In giving us these facts and figures, could you give us a breakdown of those who devote their full time to research, and those who are in the administrative end?

Mr. MACKENZIE. Certainly.

Mr. ROGERS of Florida. In the report you give us, could you give us the results that have come about already from research made.

Mr. MACKENZIE. Yes, sir.

Mr. ROGERS of Florida. I think that would be helpful to have if that has not been done. Are there any time limits on research projects at all? Do you make a review of them after a certain period of time, or how is that done?

Mr. MACKENZIE. We review our program practically continuously. Of course, in relation to projects which are supported with outside organizations, these are for specific time periods. Normally, we have

an overall program review which is included in the orderly administration of the Public Health Service on an annual basis.

Mr. ROGERS of Florida. Do you feel that you are getting sufficient support here to carry on the research that is necessary in this field?

Mr. MACKENZIE. This is a question, sir, as you undoubtedly realize, which touches upon broad fiscal policies of the Government. I can say from a technical standpoint that I think this problem is of such importance that we should all be doing more.

Mr. ROGERS of Florida. You feel more could be done if funds were provided?

Mr. MACKENZIE. Yes. Frankly, I think that some of the research which has already been done has opened up opportunities for further exploitation of the leads that have been developed.

Mr. ROGERS of Florida. May I ask you this: Are there any reports of deaths in the Los Angeles area that have been accelerated by smog? Do you know of any studies along those lines?

Dr. PRINDLE. There have been several studies. There is considerable debate, quite frankly. As I believe the chairman pointed out yesterday, Professor Mills has stated that he felt there was a considerable increase in deaths in that area. The research by the State health department does not arrive at the same conclusion. Others have been working and we have been conducting a study jointly with the State health department at the present time. We do not yet see any evidence that such is the case. However, I can only point out one problem here. It is very difficult, with deaths occurring daily in a large city of this type, to pick out those that might be attributed to a particular problem. For example, when London had its terrible episode of 1952, it was some months before it was recognized that 4,000 excess deaths had occurred in those 2 weeks.

Mr. ROGERS of Florida. Where was it that they had the deaths as the result of pollution in the area?

Dr. PRINDLE. London, Donora, Pa.

Mr. ROGERS of Florida. You stated you felt there was a definite relationship there?

Dr. PRINDLE. Yes.

Mr. ROGERS of Florida. Was it the same type of air pollution that exists in Los Angeles?

Dr. PRINDLE. No. The type of air pollution in Donora is that attributed to the burning of solid fuels, coal primarily, in association with a large industry in that area. Automobiles, if they played a role there, are comparatively minor in comparison to that played at Los Angeles.

Mr. ROGERS of Florida. Thank you.

Mr. ROBERTS. The gentleman from Nebraska.

Mr. BROCK. Mr. MacKenzie, you stated that you do have pollutant-measuring devices, did you not?

Mr. MACKENZIE. Yes, sir.

Mr. BROCK. Yesterday I entered into a colloquy with a witness regarding whether or not there would be more irritation to the general public when we use a vertical tailpipe or a horizontal tailpipe in buses and trucks in city traffic. Have you measured with your pollutant-measuring devices whether or not the general public is more irritated by the pollutants using a vertical tailpipe rather than a

horizontal tailpipe? The witness yesterday in the colloquy stated that if they would put this tailpipe on a bus that the action of the bus would bring the pollutant down into the bus proper with the windows open, but the tailpipe could be brought up and above the bus. Do you have any studies on that?

Mr. MacKenzie. The only studies that I know of that would bear on this general subject are some that have been made immediately adjacent to heavily traveled roadways and at varying distances away from them. Here you find that the dilution is relatively rapid. You find a higher concentration of pollution immediately adjacent to the heavily traveled street or highway, but you have to go only a few feet away, 10 or 20, to observe very effective dilution with the air that is coming past. There are two factors that are associated with the dispersion of pollutants in the air. One of them is what they call the molecular dispersion, and this is due to the activity of the molecules of the various substances vibrating and tending to mix in the gases that are present. The second is what you would call turbulent mixing, and this is due essentially to currents in the air, which mix the pollutants with the air. The second is the more important so far as diffusion of pollutional materials away from their sources is concerned.

Specifically with regard to whether you should direct the exhaust pipe vertically or horizontally, I would not expect that this would make a great deal of difference in the concentration that could be measured a short distance away. But next to the point of discharge, I think it is quite obvious that it would make a difference.

Mr. Brock. It is quite obvious that we are next to the point quite often in driving in cities and we could alleviate that problem with vertical tailpipes.

Mr. MacKenzie. You have various problems that would be associated with that, I think, sir. Certainly it would help to have the exhaust discharged vertically in relation to its being drawn in by a vehicle which is immediately following, because the majority of air intakes for ventilation are on a level fairly close to the point of discharge of a vehicle in front. There is the problem that was mentioned yesterday, however, of the leakage of exhaust from a vehicle into its own interior. This problem, I think, would need to be considered also.

Mr. Brock. Is your measuring device portable so that you might put it in an automobile and follow a vehicle that has a vertical tailpipe and then also follow a vehicle that has a horizontal tailpipe, and test the difference in pollutants and irritants that enter into the automobile?

Mr. MacKenzie. For certain pollutants it could be done. It could be done, for example, for carbon monoxide.

Mr. Brock. But not for the others?

Mr. MacKenzie. Not for the others so easily, so far as I am aware.

Mr. Brock. Is that because it is not portable enough?

Mr. MacKenzie. No. These are comparatively new devices for measuring most of the pollutants that we are talking about. Means for measuring carbon monoxide have been in existence for quite some time. Means for measuring automatically and continuously hydrocarbons are a more recent development.

Mr. BROCK. Could I anticipate that you will make a study on that problem?

Mr. MACKENZIE. Yes, sir; we can look into this.

Mr. BROCK. Would you furnish the results to the committee?

Mr. MACKENZIE. Yes, certainly.

(The information referred to follows:)

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE,
PUBLIC HEALTH SERVICE,
May 10, 1960.

Hon. LARRY BROCK,
House of Representatives,
Washington, D.C.

DEAR MR. BROCK: In response to your request at the hearings on air pollution, February 24, 1960, before the Health and Safety Subcommittee, Interstate and Foreign Commerce Committee, there is transmitted herewith a report on exhaust contamination introduced into passenger cars through ventilation systems. The tests run by the staff of our Robert A. Taft Sanitary Engineering Center cover various combinations of exhaust discharge and locations of ventilating system inlets. It should be pointed out that the tests were run under meteorologic conditions which would be most favorable to car exhaust constituents being drawn into the ventilating system by a following automobile. Such meteorologic conditions, however, are very common in early morning periods.

If we can be of further assistance in connection with this matter, please advise us.

Sincerely yours,

V. G. MACKENZIE,
Assistant Chief, Research and Development Division of Engineering Services.

EXHAUST CONTAMINATION IN PASSENGER CARS

Andrew H. Rose, Jr., Ralph C. Stahman, Heber J. R. Stevenson, engineering research and development unit, air pollution engineering research, Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio—U.S. Department of Health, Education, and Welfare, Public Health Service, April 1960

SUMMARY

A preliminary test program has been made to investigate some basic factors effecting the concentration of exhaust gas inducted into the passenger compartment of an automobile by the forced ventilation system. Due to the small number of tests run, it is not intended that the values developed be interpreted as statistically "normal" but rather an indication of possible levels and trends.

Tests were run on grouped moving vehicles and on group stationary vehicles to simulate heavy traffic conditions. Exhaust concentrations in the passenger compartment of vehicles under moving traffic conditions were slightly above the background curbside levels. Stationary traffic conditions with vehicles grouped at average intervals produce marked increase in exhaust concentrations with the highest recorded at 0.8 percent (370 parts per million carbon monoxide (CO)) of the raw exhaust value. In moving vehicles, the highest value recorded was 0.04 percent (20 parts per million CO) above the curbside level.

The location of the forced ventilator inlet was shown to exert a significant effect on the exhaust concentration in the vehicle passenger compartment. Front inlets as contrasted to cowl and side inlets consistently gave higher values. Stability and movement of the air mass circulating around the stationary vehicles was the second factor exerting a significant influence on passenger compartment concentration. No significant effect was indicated by the differences in exhaust tailpipe location as used in present-day automobiles. A vertically extended exhaust system gave essentially zero passenger compartment concentration.

OBJECTIVES

The objective of this study was to make a preliminary investigation of the relative amounts of exhaust gases inducted into the passenger compartment of a vehicle by the forced ventilation system when the vehicle is operating in city

traffic. Two basic driving conditions are representative of "stop and go" city traffic patterns; first, low-speed operation with slow cruise, mild accelerations and mild decelerations; and second, stationary operation at idle with the vehicles grouped with minimal interval between vehicles as if stopped at a traffic light or in a traffic tieup. Under heavy traffic conditions, when the effect of inducted exhaust gases in the passenger compartment is greatest, traffic conditions generally result in a minimum of two cars abreast.

TEST PROCEDURES

All tests used to determine passenger compartment exhaust gas concentrations employed four vehicles positioned two abreast. The lead two vehicles furnished the controlled exhaust gases and compartment concentrations were determined in the two following test vehicles. Three types of forced ventilation inlets were studied. One inlet was located just above the headlight. Another was on the cowl ahead of the windshield and the third was on the side of the vehicle at a position about two-thirds of the distance toward the rear of the car.

A comparison also was made of exhaust or tailpipe location effect. A standard exhaust system which discharges the exhaust gases downward toward the roadbed was compared with both a bumper-type exhaust system in which the exhaust gases are vented horizontally at bumper level, and with an exhaust system extended vertically to the height of the vehicle top in which the exhaust gases were discharged upward at a car-top level. For both the moving and stationary tests, measurements were made of the carbon monoxide (CO) concentration in the raw exhaust gases in the lead cars and the CO concentrations in the passenger compartment of the test cars. The amount of exhaust gases inducted into the test cars by the forced ventilation system was calculated based on CO concentrations as the percent of raw exhaust gases introduced into the passenger compartment of the test cars. The procedure used for the stationary tests was to position the vehicles, with engines at idle, ventilation system blower on full and car windows closed, and hold the conditions until readings of CO concentrations at the driver position in the test cars and in the exhaust of the lead cars could be taken. Approximately 1 minute was required for the instruments to stabilize. This procedure was repeated for different combinations of ventilation inlets and tailpipe locations for two directions of vehicle position. Moving tests were made with the four vehicles driving two abreast at approximately 20 miles per hour. CO concentrations were taken continuously with the ventilation system blower on full and car windows closed as the vehicles covered a preset one-half mile course in opposite directions.

Due to the importance of meteorological condition on the results, it was necessary to conduct the tests during periods of extremely stable air conditions. This reduced the available test time to the period from dawn to the point when the diurnal inversion would break which averaged about 2 hours. No tests were run when the wind exceeded 1 mile per hour. This further limited the available test periods to about 1 day per week.

The instrument used to measure CO concentration in the passenger compartment was an MSA carbon monoxide indicator which senses the temperature rise due to oxidation of carbon monoxide in a "Hopcalite" cell. The instrument for CO in the exhaust was a Beckman L/B model 15A nondispersive infrared detector. The instruments read 0 to 1,000 parts per million and 0 to 8 percent full scale respectively. The exhaust plumes were sometimes augmented with smoke candles to observe certain effects.

DISCUSSION

It is not intended that the values developed in this study be interpreted as "normal" values since the number of experiments required to establish normal distribution and standard deviation were not attempted. Rather, a few sample values were obtained to indicate possible levels and trends. Conditions for maximum concentration in the passenger compartment were chosen; i.e., early morning with calm stable air so that high values would be obtained since these are the levels of interest in this study.

Observed values of CO should be considered in the light of possible physiological effects. An exposure-time-concentration basis is given in figure 7 (U.S. Bureau of Standards, Technical Paper 212). Cognizance must be taken of the

facts that the effects shown for various time concentrations in the figure refer to average, healthy persons, and that the degree and severity of exposure and consequent effect vary according to changes in respiratory rate, pulmonary and cardiac function, and other factors.

The American Conference of Governmental Industrial Hygienists has set a maximal allowable concentration for industry of 100 parts per million of carbon monoxide for an 8-hour day. For ambient (community) air, the California State Department of Public Health has set 30 parts per million of carbon monoxide for an 8-hour day and 120 parts per million of carbon monoxide for 1 hour as standards.

In order to determine the optimum test program to be run in the limited time available, some exploratory studies for both moving and stationary traffic conditions were made using grouped and individual test cars. Studies of the moving traffic conditions employing grouped vehicles, figures 1–A and 1–B, were made while the cars were traveling at 20 miles per hour with normal space intervals. Smoke candles were used in the exhaust pipe of the right front car to allow an evaluation of this effect to be made.

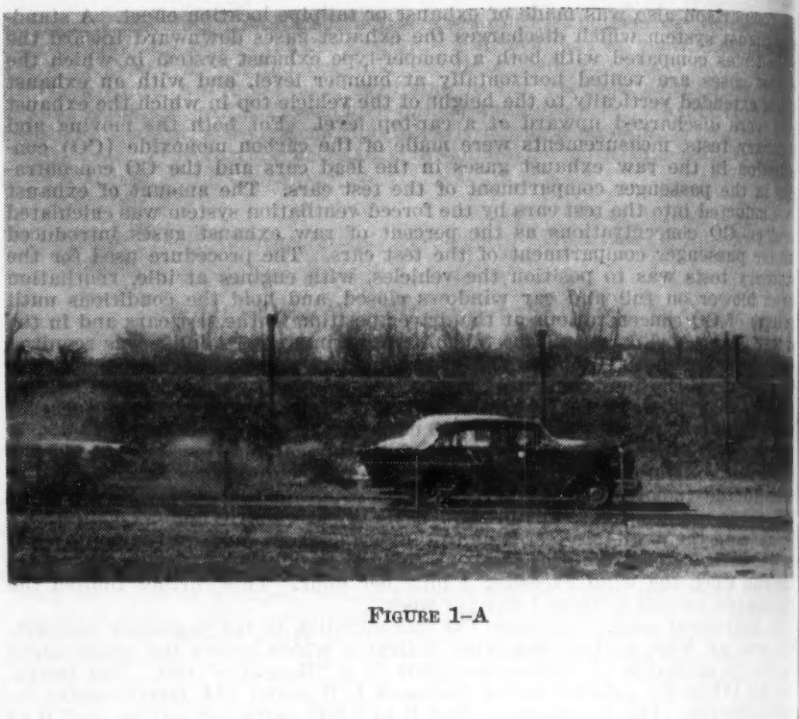

FIGURE 1–A

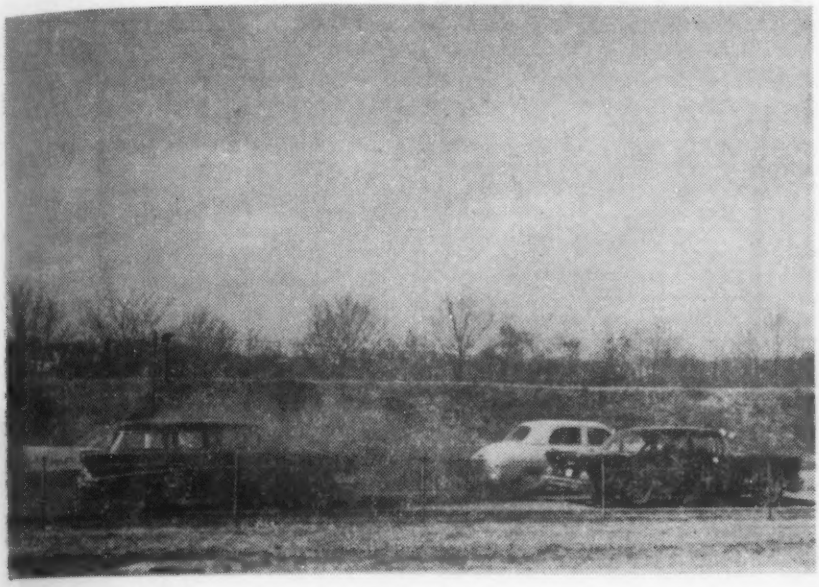

FIGURE 1–B

Moving traffic studies

Based on the turbulent expansion of the smoke plume, it can be shown that in the time interval necessary for the trailing vehicle to reach the plume from the forward vehicle, a dilution of approximately 3,000:1 took place. This results in a passenger compartment exhaust concentration as measured by a carbon monoxide concentration of about 1 parts per million. This low level was further confirmed by driving in actual city traffic and then comparing passenger compartment concentration with curbside concentration. In no case was there evidence of greater than 20 parts per million higher in the vehicle passenger compartment than the background level. It was concluded that inducted exhaust concentration buildup in the passenger compartment of moving vehicles is not sufficiently high to create serious problems.

The second phase of the study was made on stationary vehicles grouped to simulate traffic signal, railroad crossing, or other traffic tieup conditions, figures 2, 3, and 4.

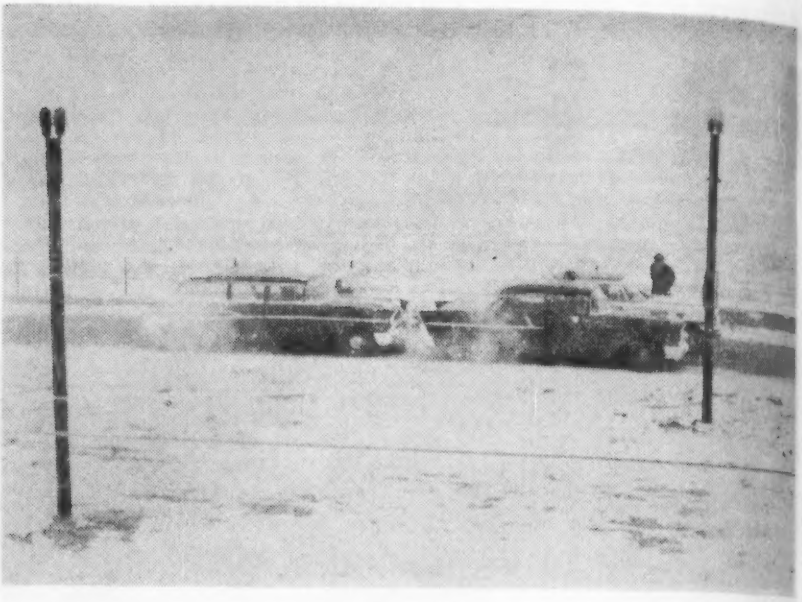

FIGURE 2–A

FIGURE 2–B

Stationary traffic studies, test 1

FIGURE 3–A

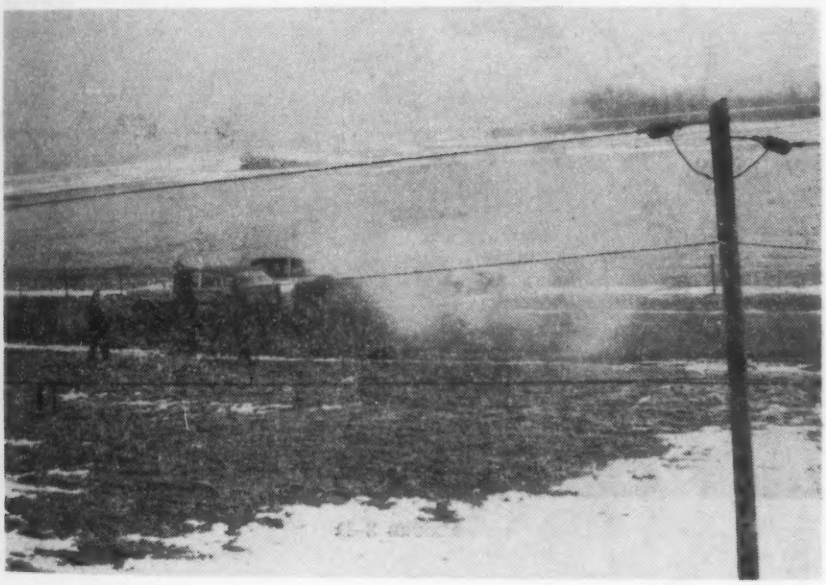

FIGURE 3–B

FIGURE 3–C

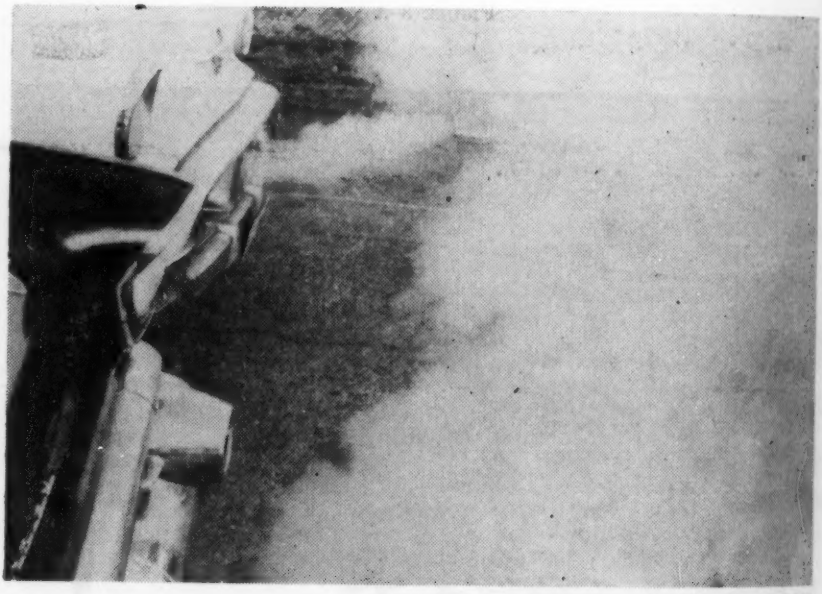

FIGURE 3–D

Stationary traffic studies, test 2

FIGURE 4–A

FIGURE 4–B

Stationary traffic studies, test 3

Due again to the limited scope of this study, not all possible arrangements were measured, but the various test conditions were selected to illustrate the effect of wind movement as well as the four most probable conditions of exhaust location and ventilator inlet position encountered with present day cars under average traffic conditions. Three test series are presented. Table 1 covers a standard automotive exhaust system in which the exhaust gases are vented downward toward the roadbed, and a bumper discharge exhaust system in which the gases are exhausted horizontally at bumper level. Table 2 covers the effects of wind drift.

The first significant trend indicated by the data, table 1, relates to the location of the forced ventilation system inlet. In general, the inlet located in the front of a vehicle as contrasted with either the cowl location or side location gave substantially higher concentrations of exhaust gases in the passenger compartment. This trend was consistent for either the standard exhaust system or the bumper-type exhaust system. Data for the side location of the forced ventilation inlet, while not shown in table 1, indicate no detectable difference from the values obtained with the cowl inlet location. The effect of exhaust location also was investigated using, first, a standard type exhaust system in which the gases were discharged downward toward the roadbed; second, a bumper-type system in which the gases were discharged horizontally at bumper level; and, third, an extended exhaust system in which the gases were discharged upward at car-top level. No difference, as to passenger compartment concentration, was evident between the two systems in common passenger car usage; i.e., the standard and bumper types, table 1. The extended system, figure 5, however, within the limitations of the test gave essentially zero passenger compartment concentrations under stable air conditions.

FIGURE 5–A

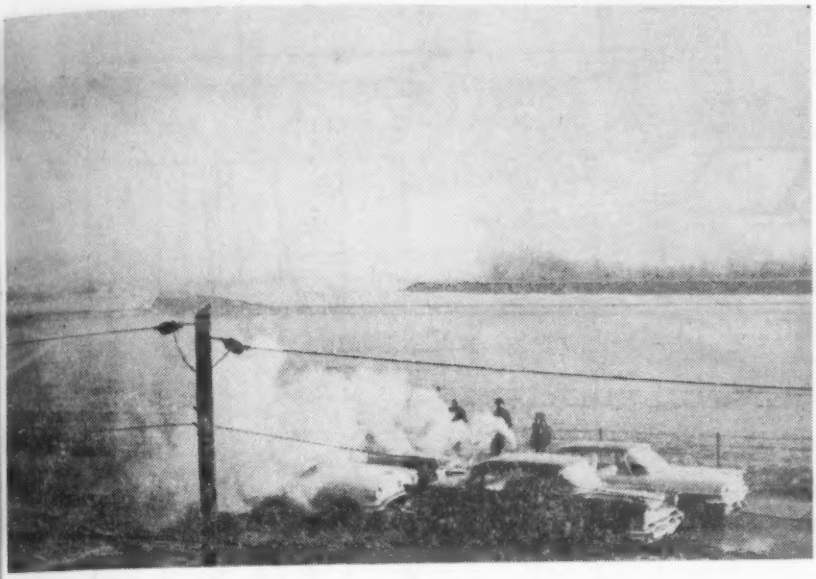

FIGURE 5–B

Elevated exhaust studies

A second equally significant trend on passenger compartment concentration, under stationary traffic conditions, is the movement of the air mass conveying the exhaust gases between vehicles, table 2. When the test vehicle is positioned downwind from the exhausts of the lead vehicles, the passenger compartment concentrations of exhaust gases, even under low wind velocities of less than 1 mile per hour, are several times higher than in vehicles in an upwind or sidewind position, figure 4–A. Under higher air velocity conditions, concentrations in the passenger compartment dropped to essentially zero. In figure 3-D the far test vehicle, in a sidewind position to the exhaust discharge, indicated zero concentrations while the near test vehicle in a downwind position resulted in exhaust gas concentrations of 0.8 percent of the raw exhaust concentrations of the lead cars. Evaluation of each of the other specific test conditions confirmed these findings, table 1.

The effect of the stability of the air mass on the ventilator-induced exhaust gases is illustrated in the action of the exhaust plumes, figures 5 and 6. When the atmosphere is stable, the plume moves horizontally over the downwind cars, figures 5–A and 6–A. Twenty minutes later the radiation from the sky toward the ground has increased over the radiation from the ground toward the sky, warming the lower layers of air. This reversal of radiation effect and the resultant warming of the lower levels of air causes vertical mixing as illustrated by the looping effect and vertical structure of the plumes, figures 5–B and 6–B.

FIGURE 6–A

FIGURE 6–B

Meteorological studies

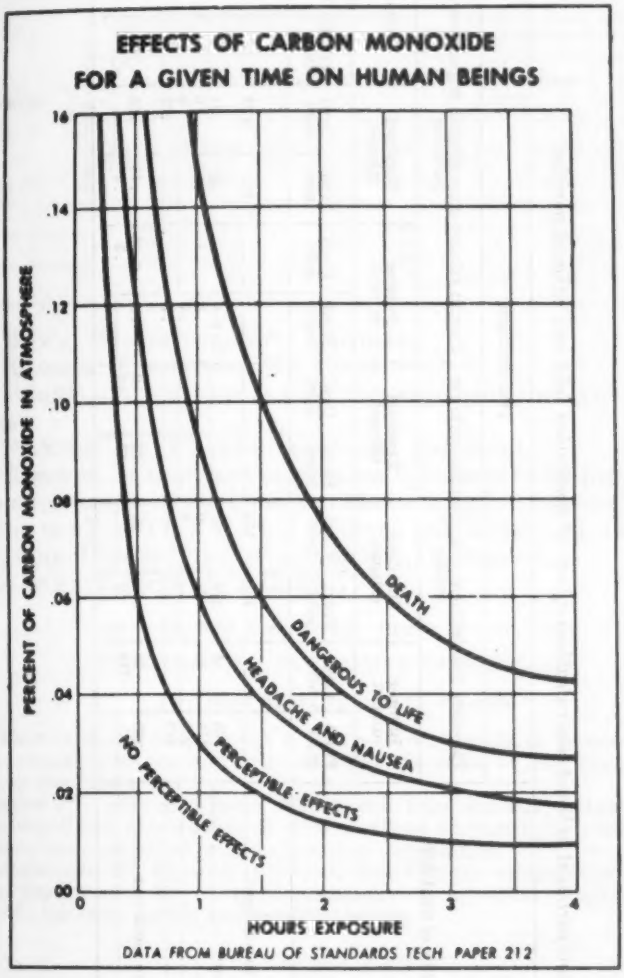

FIGURE 7.—Effects of carbon monoxide (0.10 percent CO equivalent to 1,000 parts per million).

TABLE 1.—*Passenger compartment exhaust concentrations effects of ventilation inlet and exhaust position*

Test series heading of cars	Range CO exhaust concentration lead car (percent)	Direction of wind drift	Test condition											
			Passenger compartment concentration parts per million CO						Percent exhaust concentration in passenger compartment					
			Bumper exhaust		Standard exhaust		Extended exhaust		Bumper exhaust		Standard exhaust		Extended	
			Front inlet	Cowl inlet	Front inlet	Cowl inlet	Front inlet	Cowl inlet	Front inlet	Cowl inlet	Front inlet	Cowl inlet	Front inlet	Cowl inlet
Test 1:														
East	7.2–7.2	Northwest to southeast			185	115					0.3	0.15		
Test 2:														
East	4.0–4.6	North to south	165	0	370	65			0.4	0	.8	.15		
West	3.6–4.3	do	155	35	20	0			.4	.1	.05	0		
	3.6–5.7	do	200			0			.4			0		
	4.0–5.1	do	310			30			.7			.05		
Test 3:														
East	3.7–4.8	Northeast to southwest	265	15	65	30	15	0	.6	<.05	.15	.05	<0.05	0
West	4.1–4.5	do		115	50		15	15		.3	.1		<.05	<.05

TABLE 2.—*Passenger compartment exhaust concentrations, effect of air movement*

Test series	Passenger compartment concentration, parts per million CO				Percent exhaust concentration in passenger compartment			
	Front ventilator inlet		Cowl ventilator inlet		Front ventilator inlet		Cowl ventilator inlet	
	Test car upwind	Test car downwind	Test car upwind	Test car downwind	Test car upwind	Test car downwind	Test car upwind	Test car downwind
Test 2	165	370	0	65	0.4	0.8	0	0.15
	20	155	0	35	.05	.4	0	.1
Test 3	50	65	15	30	.1	.15	.05	.05
		265		115		.6		.3

Mr. BROCK. Thank you, Mr. Chairman.

Mr. ROBERTS. Thank you, Mr. Brock.

Dr. Prindle, do you have a separate statement that you would like to make?

Dr. PRINDLE. No; I have no prepared statement.

Mr. ROBERTS. If there are no further witnesses to be heard, I would like to offer for the record this article to which I referred which appeared in the New York Herald Tribune on January 15, 1960. Without objection I should like to include it in the record.

(The article referred to follows:)

[From the New York Herald Tribune, Jan. 16, 1960]

POLLUTED AIR CITED AS ONE CANCER CAUSE

TWO NEW ZEALAND GROUPS STUDIED

SAN FRANCISCO, January 15.—A massive 10-year study of people in New Zealand has yielded evidence that polluted air is one cause of lung cancer, a medical researcher reported today.

A quarter of a million persons who moved from smoggy, industrial England into the unpolluted atmosphere of New Zealand provided the evidence. These newcomers were compared with native New Zealanders.

The researcher, Dr. David F. Eastcott, thus had for comparison two virtually identical populations—the same constitutional or hereditary makeup, the same way of life, the same eating and smoking habits.

30 PERCENT HIGHER

Lung cancer was 30 percent higher among the newcomers generally than among New Zealand's 2,300,000 native-born whites, Dr. Eastcott said. But among Britons who went to New Zealand relatively late in life, after living in England for 30 years or more, the prevalence of lung cancer was 75 percent above that for New Zealanders of the same age.

Then Dr. Eastcott compared a group who had moved from England to New Zealand 25 to 30 years ago and compared it with a similar age group of native New Zealanders.

Even though this group of immigrants had breathed polluted air for varying periods early in life, and then pure air for many years, their lung cancer hazard was 20 to 30 percent greater than in native New Zealanders of the same age, the researcher reported.

10-YEAR STUDY

The study was made in two 5-year periods while Dr. Eastcott was connected with New Zealand's Public Health Department. He now is a general practitioner. He is here as a visiting researcher at the medical school.

The conclusion is inescapable, he said, that lung cancer is a product of total environment—that polluted air plays a part, smoking another part, and infection and irritation are factors.

The symposium brings together a score of air-pollution researchers from widely separated parts of the globe. Sponsors are the Medical School and the Tobacco Industry Research Committee, which gave $28,000 toward financing the meeting.

Mr. ROBERTS. This will conclude the hearings on the progress of the air pollution legislation and the investigations that have been made, with particular reference to the device which may be able to control the harmful unburned hydrocarbons in connection with automobile emissions. I want to thank all the witnesses who have participated, members of the press, staff, and members of the committee.

The committee will stand adjourned.

(The following information was submitted for the record:)

COUNTY OF RIVERSIDE,
March 21, 1960.

Hon. D. S. SAUND,
House of Representatives, Washington, D.C.

DEAR JUDGE SAUND: This is in answer to your letter of February 24, 1960, pertaining to the bill submitted by Arthur S. Flemming, Secretary of Health, Education, and Welfare that would authorize a program of research, technical assistance, and training by the Public Health Service.

You can be assured that we in Riverside County are very anxious for increased Federal Government assistance to State and local bodies in combating air pollution.

Although it would be desirable to have a representative from the county of Riverside to testify at the next hearing on the proposed bill, we feel that the following statement for presentation to the subcommittee will reflect our feeling on the proposed legislation:

1. The people of Riverside County, through their board of supervisors, declared a need for an air pollution control district in June 1955. At that time it was recognized that Riverside County's air pollution problem was serious enough that it could be detrimental to the public peace, health, safety, and welfare of the people of Riverside County. Rules and regulations have been adopted to enable the air pollution control district to require control of air pollution from sources within the boundary of the county.

The county's approach of prevention and control of air contaminants is an enforcement type of activity and no provisions are made for the necessary research to develop new and improved ways to control contaminants. We must look to some agency that is larger, better equipped, and financed than our air pollution control district to carry out a program of research and technical assistance needed to help protect our citizens from the ever-increasing menace of air pollution.

2. Riverside County is located in an area of southern California that is rapidly being inundated with smog and other forms of noxious air pollutants. We feel that because of these circumstances, Federal Government assistance is badly needed to help in the abatement program in the local areas. We would like to encourage the elimination of the $5 million ceiling in the Air Pollution Control Act if this will increase Federal Government activities in research and investigation in combating air pollution and in this manner help State and local bodies in their fight to protect the people against the ever-increasing menace of air pollution. We do believe, however, that the amount of money expended each fiscal year should only be that which is necessary to carry on a well-planned research program.

3. Experience gained in Riverside County shows that air pollution is not a temporary problem, but is one that will undoubtedly stay with us as a result of future industrialization and increased activities of the people which results in ever-increasing pollution of the air. Since it is very doubtful that a rapid breakthrough is possible in finding causes and control for abatement of smog and certain other types of contaminants, it would appear that placing a time limitation on an expanded research program would result in the planning of only a limited program. To enable the Federal Government to have an expanded and effective research program, we would recommend the removal of the time limitation of 4 years now contained in the Air Pollution Control Act.

To summarize the above, we would like this statement to the House Subcommittee on Health and Safety to be construed as an endorsement of the bill recently submitted to the subcommittee by the Secretary of Health, Education, and Welfare.

Sincerely yours,

PAUL J. ANDERSON,
Chairman, Board of Supervisors.

RESOLUTION

Be it resolved by the Board of Supervisors of the County of Riverside, State of California, in regular session assembled on March 28, 1960, That this board supports the bill before the House of Representatives which is sponsored by the Department of Health, Education, and Welfare to authorize a program of research, technical assistance, and training by the Public Health Service in the field of air pollution control; that this board favors the elimination from the Federal air pollution control program of any time limitation for such research and study, and the removal therefrom of the present annual ceiling of $5 million for expenditures; and be it further

Resolved, That this board recommends that the research program conducted at the Federal level be so carried on as not unnecessarily to duplicate research activities carried on at State or local levels and that the same be coordinated with other research programs in order to obtain the maximum benefits from all of such activities; and be it further

Resolved, That certified copies of this resolution be forwarded to the Subcommittee on Health and Safety of the House of Representatives and to the Honorable D. S. Saund, Member of Congress from the 29th District of California.

WESTERN OIL & GAS ASSOCIATION,
Los Angeles, Calif., February 23, 1960.

Re air pollution control.

Hon. KENNETH A. ROBERTS,
Chairman, Subcommittee on Health and Safety of the House Interstate and Foreign Commerce Committee, Washington, D.C.

DEAR CONGRESSMAN ROBERTS: We appreciate very much the interest your honorable subcommittee is taking in air pollution control. We regret that due to time and distance involved we are unable to have a representative at the public hearings your subcommittee is holding on this matter.

However, if you would permit, we should like to present for the record the following, which may be of some help to your honorable subcommittee:

The cost of air pollution control to the petroleum refineries in the United States can only be approximated. However, since 1948 the refineries in Los Angeles County have spent some $47 million, of which $3 million has been for research. The remarkable accomplishment in the reduction of the emission of major air pollutants by these refineries which daily process about 750,000 barrels of crude oil is shown by the following data:

	Tons per day	
	Current emissions with controls	Potential emissions without controls
Hydrocarbons	103	800
Sulfur dioxide	145	745
Particulate matter	10	145

The Los Angeles Air Pollution Control District has made repeated public statements to the effect that air pollution emissions from the refineries in Los Angeles County have been controlled to a practical minimum and no longer represent a major source of air pollution.

Major expenditures have also been made to control the escape of gasoline vapors in the loading of gasoline trucks for distribution to service stations. Over 90 percent of the emissions from this source has been eliminated.

As a further indication of the industry's concern in the solution of the Los Angeles smog problem, it is currently cooperating with the Los Angeles County Air Pollution Control District, U.S. Public Health Service, and Bureau of Mines in a program to determine the effect of gasoline composition on the smog-forming potential of automobile exhaust. While there is little indication of any significant improvement by this means, the industry has approached the problem with an open mind and is prepared to spend the many millions of dollars involved in such a change in gasoline composition if the cooperative program indicates that this is a worthwhile approach.

However, it appears that a more productive and permanent method of controlling automobile exhaust is the use of an exhaust control device.

In a developed urban area, after industry emissions are controlled, the contribution from the automobile continually represents an ever-increasing percentage of the total emissions. In Los Angeles County, the automobile is responsible for 70 to 80 percent of the total smog-forming emissions.

We believe that whereas stationary sources should be controlled at the local level, moving sources, such as the automobile, should be controlled from the State level. Our industry is supporting legislation in California that would bring about this control.

The degree of effectiveness of these controls is greatly improved by the sum total of knowledge concerning methods and devices for control, and a thorough knowledge of the condition of the air in each of the communities involved. It is in these fields that we feel the Federal Government can be of great help.

We therefore believe and recommend that the Federal Government should support the air pollution control effort by helping State governments set ambient air standards and by contributing to research by private and governmental agencies. We believe that this contribution from the Federal Government should be maintained at its present level.

Very truly yours,

FELIX CHAPPELLET,
Vice President and General Manager.

SAN FRANCISCO, CALIF., *March 1, 1960.*

Re antiair pollution.

Hon. WILLIAM S. MAILLIARD.
House of Representatives, Washington, D.C.

DEAR MR. MAILLIARD: I returned your questionnaire last week.

Now, with reference to the enclosed article, would you please be so good as to relay my message herein to the proper committee?

Los Angeles is not the only place in California plagued with air pollution. I have lived in San Francisco all of my life in perfect health, but have had to spend sums of money, last year, with oculist, nose and throat specialist, sinus X-rays, and general practitioner, only to be informed that all results are negative and my corneal ulcers and inflamed and weepy eyes are the result of air pollution.

And how foolish of the manufacturers to want to limit the installation of an anti-air-pollution device only to cars sold in California, the State which extends such a welcoming hand to the tourist trade from all over the United States, and which said tourists visit us during the dry summer months when there is no rain in California to wash the atmosphere clean.

Anything, whatever it is, that is a serious menace to public health should be abated and the only way to handle a matter of this character is at its source. Then it is under proper control.

The installation of such a device, the cost of which is nominal, $10 to $30 per car, will not in any manner kill a sale when a man wants a car, if the device is built into any and all cars and included in the price of the car. The manufacturer won't be out anything. In fact, he will be creating jobs.

Neither will the manufacturer be halting inflation by not including the device in his cars. What the public does not pay for antismog devices, it now is paying on doctor bills and medicines.

We claim a shortage of doctors. This medical treatment of an unnecessary and avoidable discomfort can be devoted to patients with other ailments who need medical care.

Foreign cars without an anti-air-pollution device should not be salable here. This may help to keep out the competition.

I assure you that I and many other of your constituents will be grateful for your assistance in this matter.

Very truly yours,

HILDEGARD W. SWIM.
Mrs. Hildegard W. Swim.

[San Francisco Examiner, Feb. 24, 1960]

TEN DOLLARS TO THIRTY DOLLARS PER CAR: ANTISMOG DEVICE FOR CARS DEBATED

WASHINGTON, February 23.—An anti-air-pollution device to be installed on new cars sold in California next year touched off 2 hours of debate today at a House commerce subcommittee hearing.

"Air pollution does not stop at State boundaries," said Chairman Kenneth A. Roberts, Democrat, of Alabama.

He said if the device is as effective and as inexpensive as the automotive industry claims, it should be installed on all new cars.

Karl M. Richards, manager of field services for the Automobile Manufacturers Association, said the industry will make the device available to any area "that needs or wants it."

He said the device is being introduced in California because of of a serious smog problem in Los Angeles, also severe in San Francisco. He said pollution problems differ from area to area and the device may not be effective outside Los Angeles.

He said the device would cost $10 to $30 per car, and even at $10 a car it would cost the motoring public about $70 million to install the device on all 1961 models.

Representative Paul F. Schenck, Republican, of Ohio, said auto manufacturers are willing to change the design of their cars to increase sales, "but it seems to me they are reluctant to add safety features."

Richards called this statement unjustified. He said the industry installs safety features after their effectiveness is proven.

The industry announced last November it would install the anti-air-pollution device on all new cars, trucks, and buses to be sold in California in 1961 in an effort to help combat the Los Angeles smog problem.

Richards said the device would remove all unburned hydrocarbons from the exhaust fumes. Another device not recommended by the industry, he said, costs only 69 cents but is only 20 to 70 percent effective.

The device feeds crankcase gases back into the engine where hydrocarbons are burned up. Hydrocarbons produced in automobile engines are compounds made up of hydrogen and carbon which the subcommittee says makes up a good part of the irritating smog plaguing Los Angeles.

(Thereupon, at 11:50 a.m., the hearings were concluded.)

(For information, there follows the recommendation of the Secretary of Health, Education, and Welfare dated February 19, 1960. This was introduced by Mr. Roberts as H.R. 10696, and the report of the Bureau of the Budget is included herewith:)

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE,
February 19, 1960.

Hon. SAM RAYBURN,
Speaker of the House of Representatives,
Washington, D.C.

DEAR MR. SPEAKER: I am enclosing for your consideration a draft of a bill amending the Air Pollution Control Act (Public Law 84–159, as amended by Public Law 86–365), which now authorizes a program of research, technical assistance, and training by the Public Health Service of the Department of Health, Education, and Welfare.

The draft bill includes amendments which would:

(*a*) eliminate the time limitation (June 30, 1964) and $5 million ceiling on annual appropriation included in the current act;

(*b*) authorize the Surgeon General to make investigations and to hold public hearings on air pollution problems which are interstate in nature or are of broad significance;

(*c*) delete the requirement for allotment of funds appropriated for grants-in-aid and contracts in accordance with regulations prescribed by the Secretary of Health, Education, and Welfare.

Air pollution is now a serious problem. In the future, the potential problem will increase greatly because of further industrial growth and concentration of population in urban areas. Our Nation's technological society produces great material benefits for the people, but also creates, as byproducts, potential problems of contamination of our environment. Air pollution is not a temporary problem, but one which will require continuing attention. Continuing research and control efforts will be necessary if major adverse effects on the public health and welfare are to be prevented. We believe, therefore, that the time limit on program authorization contained in the present act is undesirable and that the act should be amended to make the authorization permanent.

Similarly, we believe that the $5 million limitation on annual appropriations should be eliminated. In the air pollution program to date, important leads have been developed in research, particularly with respect to the effects of air pollutants on health. Any important "breakthrough" in this field may require an expansion of activities to further its development and exploitation. Furthermore, we believe that an appropriation ceiling is not generally desirable in legislation authorizing a research and technical assistance program. Such a ceiling may serve as an undesirable restriction at times, and at other times tend to encourage requests larger than consistent with overall circumstances and fiscal policy. We believe that fiscal control can best be exercised through the usual annual appropriation process.

As specific examples of opportunities for expanded research and investigation activities which may necessitate larger appropriations in future years, we would like to cite the following:

(*a*) In the past year increasing evidence has accumulated of a causative relationship between air pollution and the invidence of respiratory chronic disease conditions. Further studies are urgently needed to investigate more fully these relationships and delineate practical procedures applicable in air pollution control practice.

(*b*) Over the past several years, research has gradually accumulated evidence that many of the effects from air pollutants come, not from the contaminants originally discharged to the air, but from transient products of physical and chemical reactions occurring among them in the open atmosphere. Air chemistry research of this kind is difficult and exacting, but it is highly important as a necessary foundation for sound and effective control procedures.

(*c*) Broad expansion of the assay and appraisal of State and local air pollution problems is highly desirable. During the past several years improved procedures for such assay and appraisal have been under development. In our opinion, this is primarily a responsibility of State and local governments. Such activities are so important, however, that Federal leadership and assistance should be available to accelerate them.

The proposed amendments would also provide for exercising Federal leadership in dealing with air pollution problems of broad significance or which are interstate in character. The Department of Health, Education, and Welfare could, we believe, make a significant contribution to such leadership through the development and publication of recommendations based on the evaluation of data developed by the Department or presented by others, as well as a full consideration of the points of view of all parties having a significant interest in such problems. Some of these problems, although essentially local in character, manifest themselves in many communities throughout the Nation. Others involve pollution from sources within one State which, through the movement of air masses, affect communities in other States. Both types of problems can be expected to increase in number and extent with further urbanization, and the development of solutions for them may in many cases transcend the capabilities of local agencies, and even of State control authorities. The recommendations resulting from such hearings would not be binding upon the participants in the hearings or anyone else; the purpose of the hearings would be simply to develop such recommendations as a means of focusing public attention on and developing support for the most carefully considered solutions to the problems which occasioned the hearings.

The proposed deletion of the requirement in the act for allotment of funds appropriated for grants-in-aid and contracts is a technical amendment. Such allotment procedures are appropriate to distribution of program grants-in-aid to State or local governments on a formula basis. However, for project-type grants and contracts, as authorized by the present act, the allotment procedure serves no useful purpose.

I shall appreciate it if you will be good enough to refer the enclosed draft bill to the appropriate committee for consideration.

In compliance with Public Law 801, 84th Congress, there is enclosed a statement of cost estimates and personnel requirements which would be entailed by enactment of the proposed legislation.

The Bureau of the Budget advises that enactment of this legislation would be in accord with the program of the President.

Sincerely yours,

ARTHUR S. FLEMMING, *Secretary.*

ENVIRONMENTAL HEALTH ACTIVITIES, PUBLIC HEALTH SERVICE PROGRAM

Air pollution estimate of cost 1961–65

NEW LEGISLATION

Item	1961	1962	1963	1964	1965
Appropriation requirements: Above level ($4,921,000) in the budget for 1961:					
Personal services	0	$53,000	$92,000	$125,000	$151,000
Other objects	0	47,000	58,000	75,000	99,000
Total	0	100,000	150,000	200,000	250,000
Expenditures:					
Personal services	0	50,400	90,000	120,800	147,700
Other objects	0	42,300	56,900	68,700	95,400
Total	0	92,700	146,900	189,500	243,100
Man-years of employment:					
Administrative services:					
Administrative staff assistant	0	1	1	1	1
Clerical assistant	0	1	1	1	1
Air pollution program:					
Clerical assistant	0	1	2	3	4
Engineer	0	1	2	3	4
Medical officer	0	1	1	1	1
Public health program specialist	0	1	2	3	3
Scientist	0	1	3	4	6
Statistician	0	0	1	1	1
Laboratory technician	0	1	1	2	2
Total	0	8	14	19	23

NOTE.—The estimate includes only additional costs under the proposed new authority for investigations and hearings.

A BILL To provide for public hearings on air pollution problems of more than local significance under, and extend the duration of, the Federal air pollution control law, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 3 of the Act of July 14, 1955 (42 U.S.C. 1875b) is amended by striking out ", upon request of any State or local government air pollution control agency,", by striking out "such State or local government air pollution control agency" and inserting in lieu thereof "any State or local government air pollution control agency", and by inserting before the period at the end thereof ", but only if requested to do so by such State or local government air pollution control agency or if, in his judgment, such problem may affect or be of concern to communities in various parts of the Nation or may affect any community or communities in a State other than that in which the matter causing or contributing to the pollution originated".

SEC. 2. Such Act is further amended by redesignating sections 6, 7, and 8 as sections 7, 8, and 9, respectively, and inserting after section 5 the following new section:

"SEC. 6. (a) Whenever, on the basis of reports, survey, or studies, he believes it appropriate, or whenever requested by any State or local government air

pollution control agency, the Surgeon General may call a public hearing on any problem of air pollution which may affect or be of concern to communities in various parts of the Nation or which may affect any community or communities in any State other than the State in which the matter causing or contributing to the pollution originates. Any such hearing shall be conducted before a board composed of not less than five members, appointed by the Secretary of Health, Education, and Welfare, who shall be representative of the public, industry which is affected by or concerned with the problem, persons who are expert or have special knowledge in the matter, interested Federal agencies, and interested State or local government air pollution control agencies.

"(b) Subject to regulations of the Surgeon General, an opportunity to be heard at such hearing shall be accorded to all interested persons.

"(c) After consideration of the information presented at the hearing and such other information as is available to it, the board shall make a report and recommendations to the Surgeon General on such matters as the existence, cause, and effect of the air pollution on which the hearing was held, progress toward its abatement, and other related matters. Such report and recommendations, together with the comments and recommendations, if any, of the Surgeon General with respect thereto, shall be made available to the community or communities, Government agencies, and industries concerned and, to the extent the Surgeon General deems appropriate, to the public, but shall not be binding on any person, agency, or organization."

SEC. 3. Section 5 of such Act (42 U.S.C. 1857d) is amended—

(1) by striking out "for each of the nine fiscal years during the period beginning July 1, 1955, and ending June 30, 1964, not to exceed $5,000,000" in the first sentence and inserting in lieu thereof "for each fiscal year such sum as may be necessary", and

(2) by striking out ", and shall be allotted in accordance with regulations prescribed by the Secretary of Health, Education, and Welfare" in the last sentence.

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D.C., June 20, 1960.

Hon. OREN HARRIS,
Chairman, Committee on Interstate and Foreign Commerce, House of Representatives, Washington, D.C.

MY DEAR MR. CHAIRMAN: This is in reply to your request of March 2, 1960, for the views of the Bureau of the Budget on H.R. 10696, a bill to provide for public hearings on air pollution problems of more than local significance under, and extend the duration of, the Federal air pollution control law, and for other purposes.

This proposed legislation is identical with the draft bill transmitted with a letter to the Speaker of the House of Representatives by the Secretary of Health, Education, and Welfare on February 19, 1960, a copy of which is enclosed.

The Bureau of the Budget concurs with the views expressed by the Secretary in his letter. The President, in his 1961 budget message, stated that the Secretary of Health, Education, and Welfare will make legislative recommendations to authorize greater Federal leadership in combating air pollution. The provisions of H.R. 10696 are designed to accomplish that objective.

Accordingly, I am authorized to advise you that enactment of H.R. 10696 would be in accord with the program of the President.

Sincerely yours,

PHILLIP S. HUGHES,
Assistant Director for Legislative Reference.

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